TRAFFIC ENGINEERING

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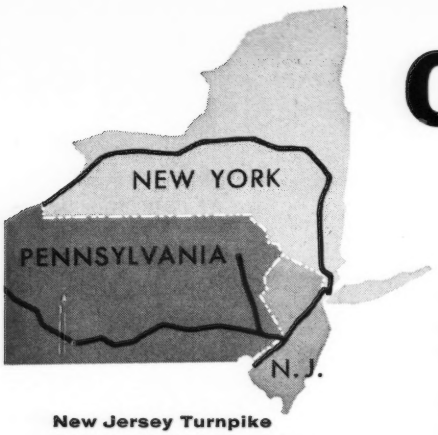

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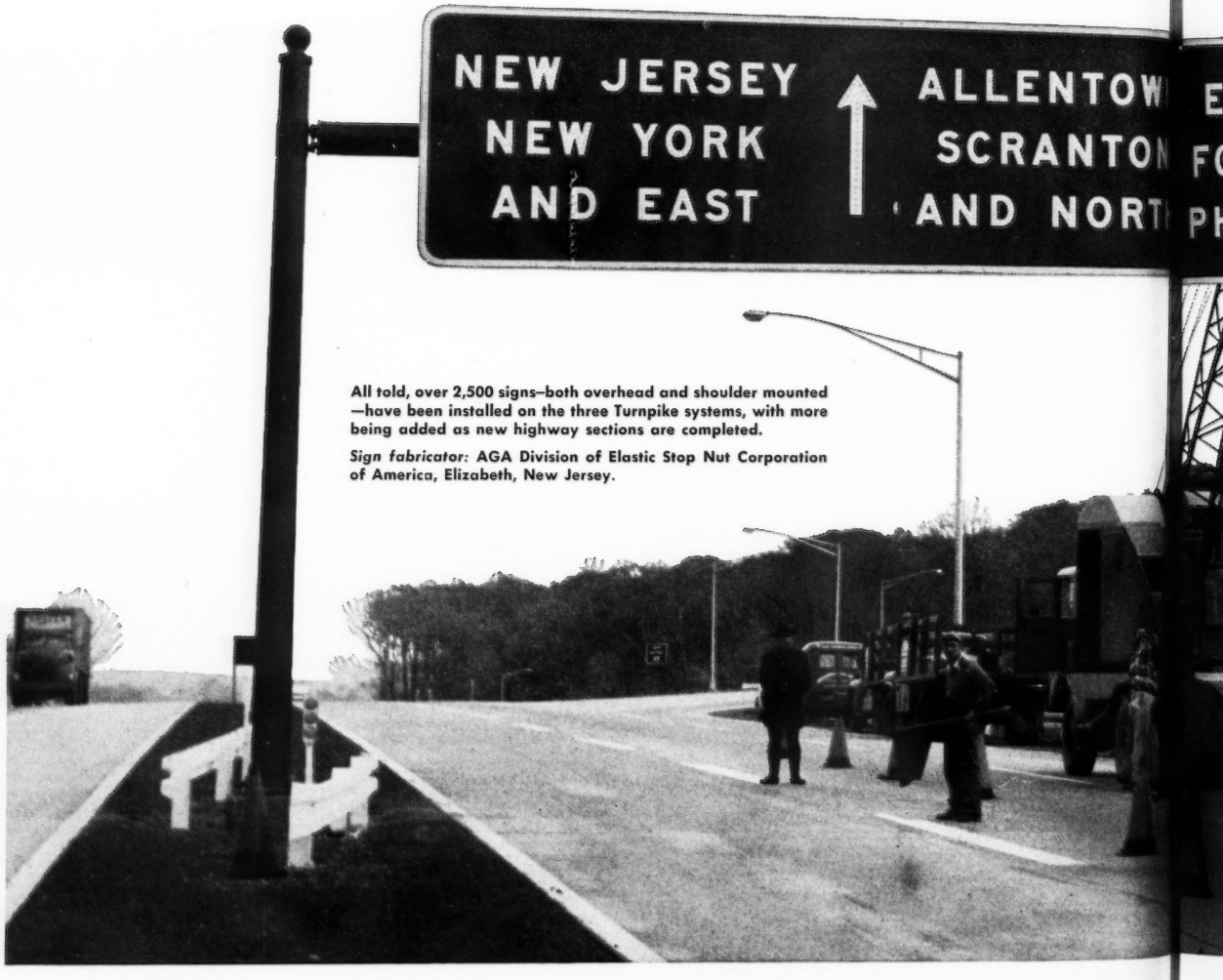

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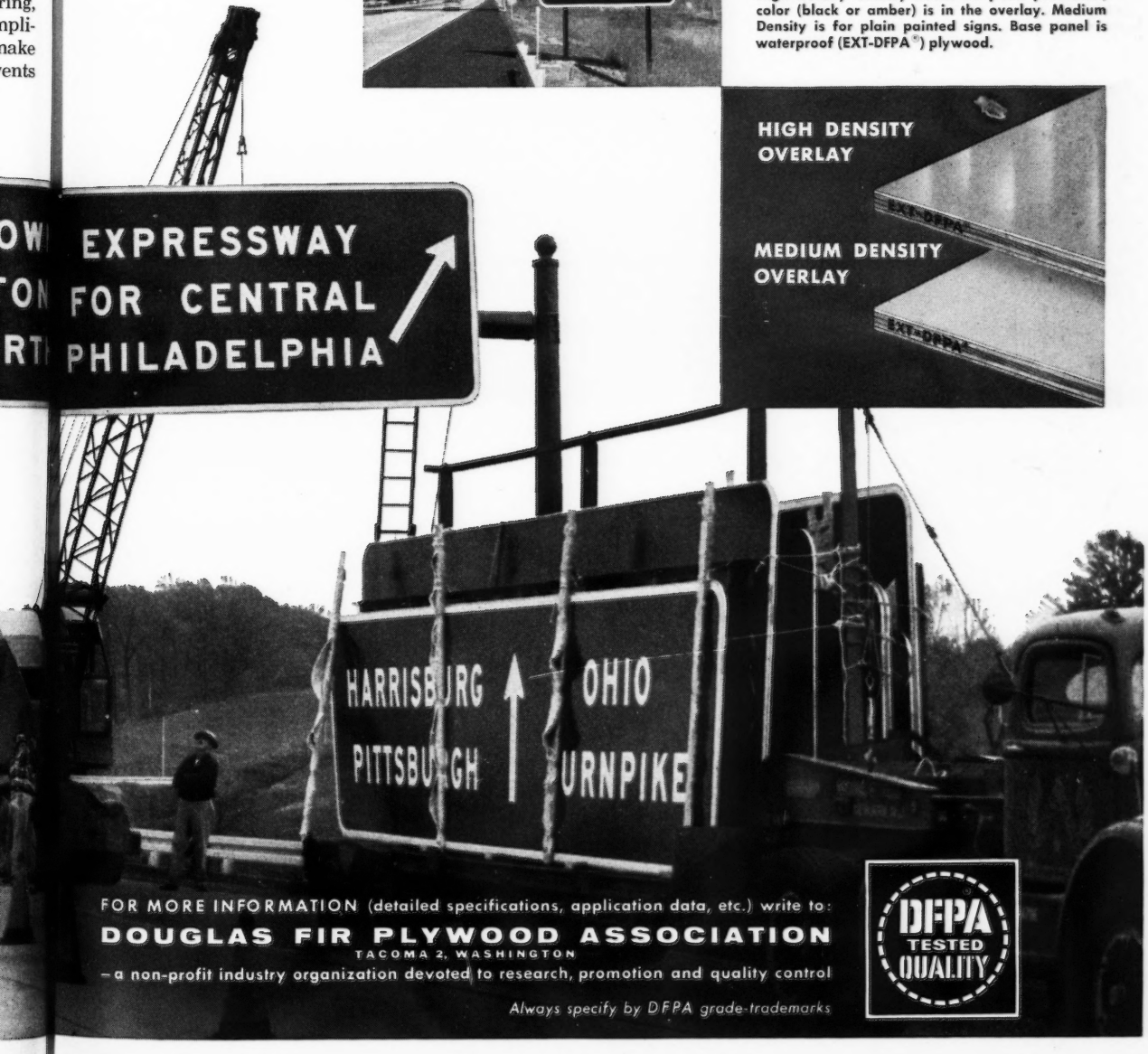

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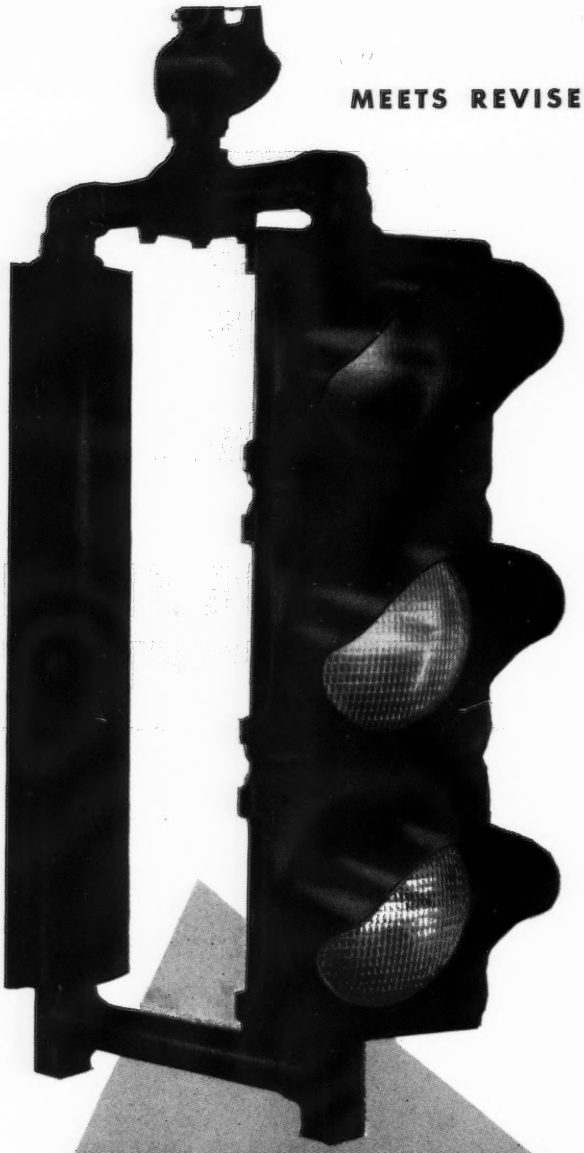

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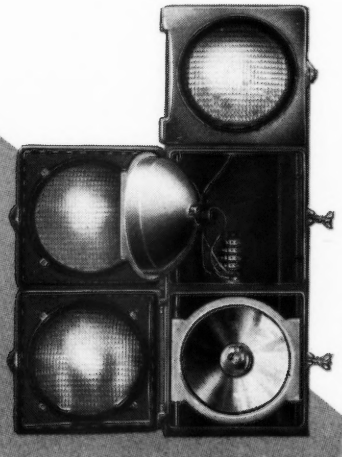

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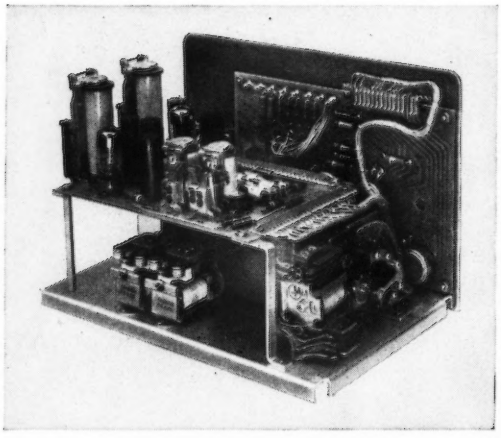

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TRAFFIC ENGINEERING

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

Vol. 29 DECEMBER, 1958 Number 3

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COVER: An aerial view of Portland, Oregon, with Lloyd Center shown superimposed (see G. R. Cysewski's article in this issue).

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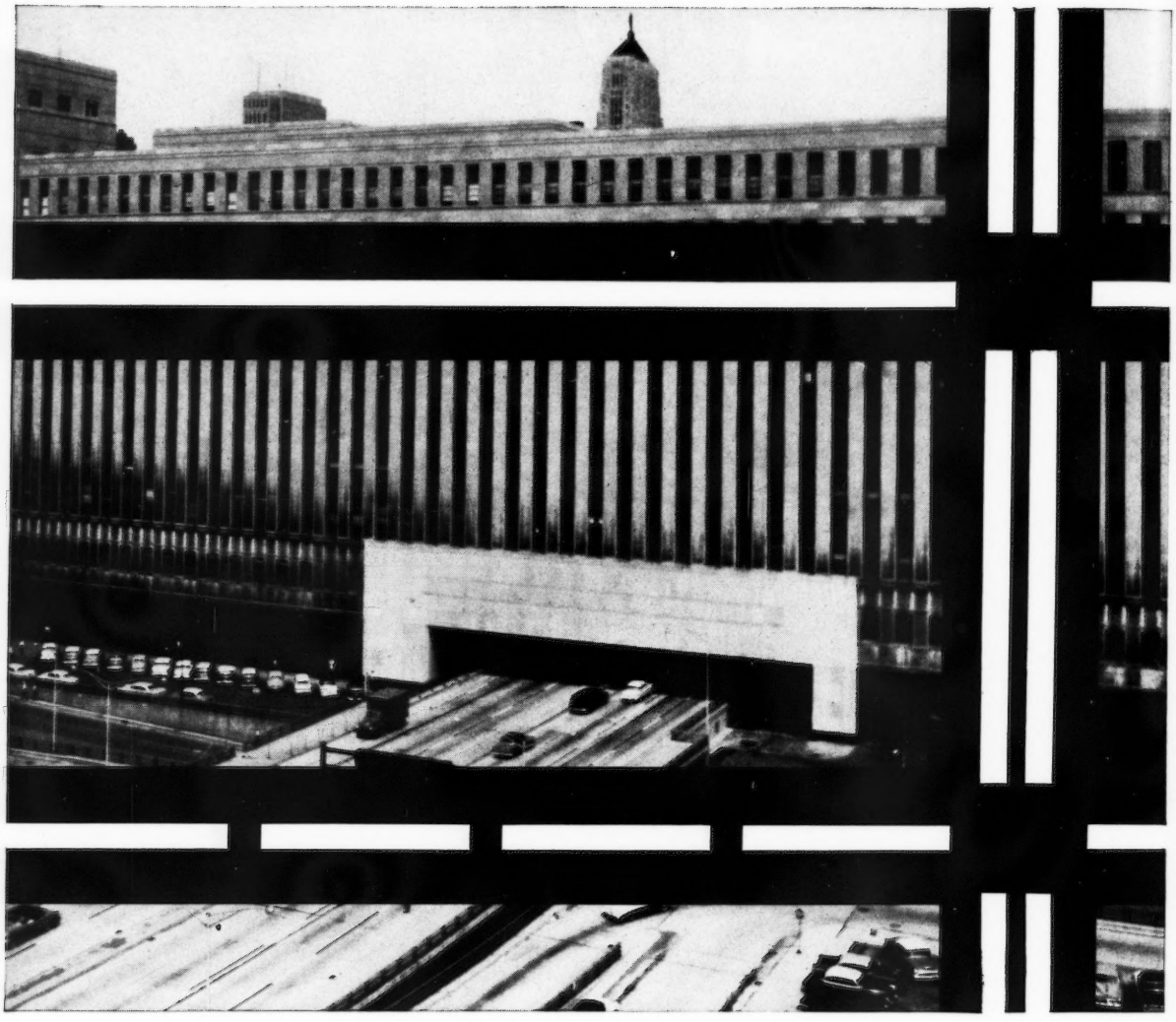

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Frankly Speaking . . .

IN MY DESIRE to obtain a cross-section viewpoint of the membership regarding the affairs of the Institute, a letter was sent to some 200 members of various grades asking two questions: (1) What are our weaknesses? and (2) What suggestions do you have for correcting these weaknesses? The response to this inquiry indicated the interest our members have in the affairs of the Institute and its future.

The correction of the weakness of the Institute is, of course, of paramount interest and necessity. We stand at the threshhold of a new world of transportation as radical as that which marked the transition from horse-drawn stage coaches to the steam railways more than a century ago! Cities are flattening out with people moving to the suburbs, from the suburbs to the country, and from the country to the farmlands. All of this is being brought about because of the social change in transportation owing to the automobile.

These are, of course, straws in the wind for all of us because while it does bring about traffic problems, on the other hand it gives us a challenging opportunity to solve problems and thereby win recognition for our profession. Despite the tremendous increase in traffic in recent years, our profession has done an amazing job in relieving congestion and accidents. If we are going to continue to keep abreast with the increased traffic problems, we must make certain that we have adequate research, and a collection of case histories, to apply to the task at hand. Your Board of Direction is cognizant of the obligations the Institute has in making sure that we are moving in the proper direction. In order to reach our objectives, it is my conviction that we must increase our activities in three areas: (1) We need to gain more recognition of our profession with one of the objectives being the professional registration of our members; (2) Our technical activities must be increased so that we are producing better technical reports; and (3) We need to strengthen our sections so that they are taking a more active interest in all of the affairs of the Institute.

May I suggest that all members take a major interest in the affairs of the Institute, thereby making it a greater society and one that will help all of us to cope with the problems that will be faced in the near future. Your letters of criticism or of suggestion shall always be welcomed by me or other officers and directors.

MATTHEW C. SIELSKI
President
Institute of Traffic Engineers

"Cuts maintenance to the bone"

AND IT'S TASSCO FOR SIGNS

The signs, provided by Traffic & Street Sign Company, are the new Increment Sheet Signs. The faces are in strict accordance with the Federal Interstate Highway Signing Manual. In this way, P & K and Tassco, associated companies, provide a unified responsibility for the entire program.

This is North Carolina's new Interstate Highway Route 40. Since, under the terms of the construction program, North Carolina is to maintain the road, the State specified those materials which would keep such costs at an absolute minimum. Their choice was Pfaff & Kendall's all aluminum sign spans and Traffic & Street Sign Company's increment sheet signs with tapered aluminum supports. Thus, with 9 large sign spans, 1193 signs, and 501 sign supports, not one drop of paint is required for maintenance!

Take the sign span in the photo for example, 90 feet wide, it bears nearly 500 square feet of sign, and without a center support. Yet it provides all the strength demanded—enough to withstand 100 mph winds—yet light enough in weight to have made installation unbelievably easy. As a matter of fact, it took only eight minutes to erect the 90-foot truss section! As for maintenance, there is none. The good-looking aluminum span never needs painting, not at installation or at any other time.

For any signing program, there's a wealth of helpful data available through the Tassco-P & K Highway Planning Committee, including a full color movie of the North Carolina program. This service, as well as the planning assistance of the Committee is available without charge to all State Highway Depts. Address your requests to "Committee."

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Portland's Lloyd Center

By G. R. Cysewski
(Associate Member, ITE)
Director of Planning, Traffic and Highway Engineering
John Graham and Company, Seattle, Washington

LLOYD CENTER, with its more than 3,600,000 square feet of area and three level parking for over 8,500 cars, will be located within six minutes driving time (1.6 miles) of the Portland, Oregon, Central Business District. It is the first major shopping center to be built in the heart of a city.

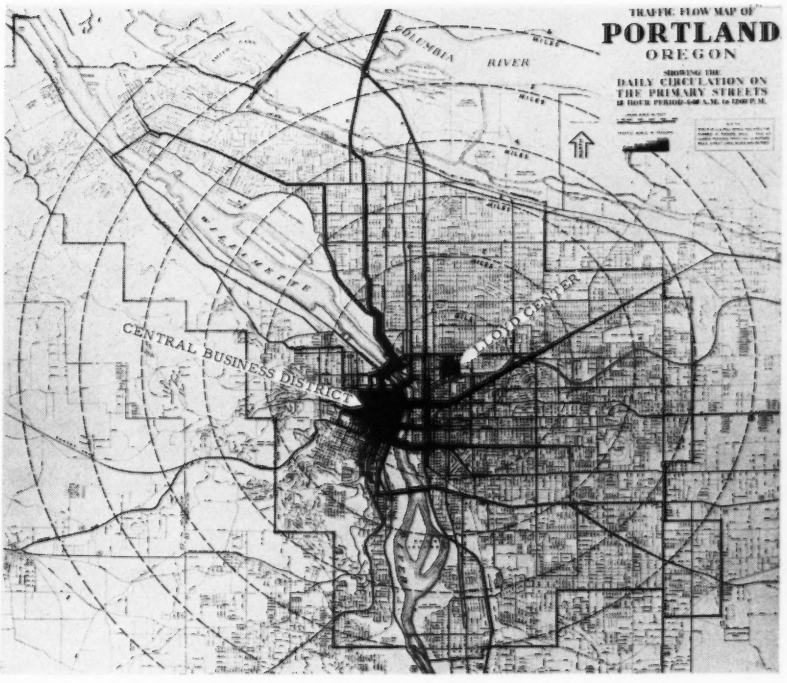
In addition to its sheer size and close proximity to the Central Business District, Lloyd Center will be noteworthy in many respects. The 56 square blocks of its area, including the equivalent of 34 square blocks of parking, is across the Willamette River from the Central Business District. Eighty-two per cent of Portland's population lives on the Lloyd Center side of the river.

The mall will be connected to the parking decks by escalators and stairways. The project includes 36 escalators.

The Lloyd Center development is beyond the dreaming, planning, and design stages after eight years of cooperative effort. Over 21-million dollars of contracts have been awarded for base construction, not including many store fronts and outside finishes which will raise the total to over 30 million dollars. The tenants will spend a like amount on interiors, equipment and fixtures.

Lloyd Center will be one of the largest fireproof structures in the United States with 3.6 million square feet of reinforced concrete structure. The 1.2 million square feet of rentable area is twice the size of Seattle's Northgate, the prototype of the modern regional shopping center. Northgate was opened in 1950 and designed by the same architects and engineers.

The extensive and detailed studies throughout the eight years of analysis, planning and plan preparation was a well coordinated effort of the Lloyd Corporation and local government officials. The outstanding recognized authorities associated with this project included Harland Bartholomew and Associates, City Planners, St. Louis, Missouri; Larry Smith and Co., Economic Analysts, Seattle, Washington; and John Graham and Company, Architects and Engineers, Seattle - New York.



Each phase of development of a project of this size and complexity required extensive study and review. Even briefly reviewing these problems is beyond the scope of this report. Such review would be a rather thorough treatise on the planning, marketing, leasing, and design phases of shopping centers. Pictorial review of the Lloyd Center model enables a much more rapid comprehension and appreciation of elements most interesting and of concern to the traffic engineer.

Mall Design

Lloyd Center is a "mall" plan design, with a pedestrian street where no vehicular traffic can interfere with shopping activities. Shopping ease is the Lloyd Center theme. Over one-third more shops are in a given area than is possible downtown. There will be no streets to cross, —no intersections. The outside traffic noise will be subdued by screening. Soft music will be piped to all malls and buildings. Covered walks and balconies protect the shopper from the weather. Planted areas and shaded benches provide opportunities for relaxation. An unusual feature will be the outdoor skating rink in the Central Plaza adjacent to the department store, Meier & Frank.

Parking

Eighty - five hundred vehicles can park in Lloyd Center, 5,000 of those

Figure 1

This aerial view of Portland, looking S.E. toward the Central Business District, upon which a photograph of the model Lloyd Center has been superimposed, shows the close proximity to the Central Business District and the traffic facilities serving the Center.

Beyond the retail core of Lloyd Center is the new Sheraton Hotel, under construction, which will have direct pedestrian access to Lloyd Center, the existing Department of Interior's Bonneville Administration Office Building.

The Banfield Expressway, now under construction, has interchange ramps (off the picture to the left) planned to and from the proposed 16th Avenue Bridge.

The off-ramp connection for Eastbound traffic from the Banfield Expressway under the 16th Avenue Bridge, and over the Lloyd Boulevard Extension, to Holladay Street, is a product of close, cooperative design of the Oregon Highway Department, Portland City Engineer's Office, and the Architects and Engineers, John Graham and Company, as was the detailing of the Lloyd Boulevard extension alignment which is grade-separated from both the other structures and feeds into the Northbound 16th Avenue lanes.

The vehicle tunnel, under 15th Avenue, which will be one-way Southbound, leads to 16th Avenue, which will be one-way Northbound.

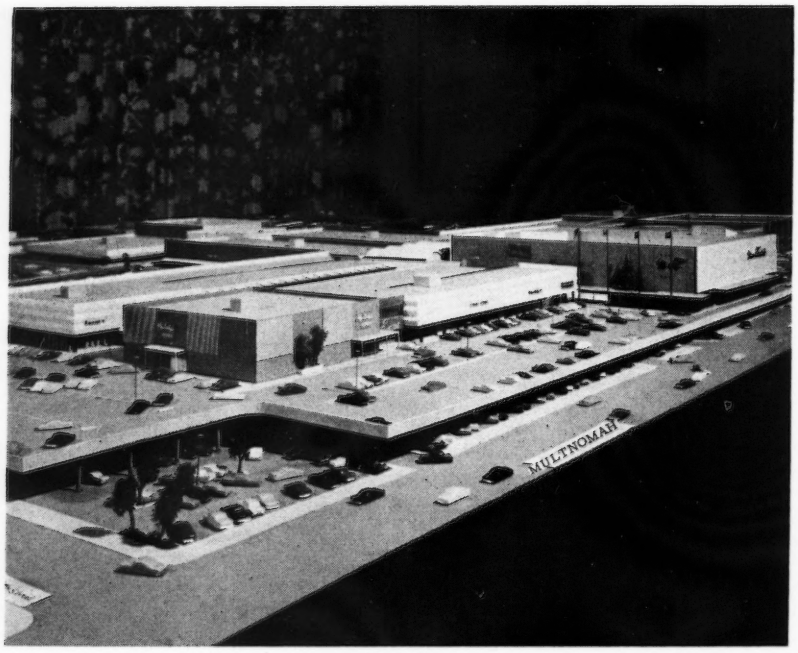


Figure 2
Lloyd Center Model

View to the N.E. from Multnomah and 9th Avenue showing the vertical separation between the Multnomah and Mall levels. An intermediate parking level is designed north of the first line of buildings and the Meier & Frank Store.

under cover. This, with the abutting and enclosed street parking, will accommodate over 10,000 parked vehicles.

The three-level parking will not be underground. Each level of the "under cover" parking area will have access to surface streets. Interior ramps provide easy movement from one level to another.

The three-level parking for Lloyd Center is economical compared to the cost of added property. Multilevel parking and shopping will greatly multiply one of the major advantages of the modern regional shopping center—free parking, close to the shops and stores.

The parking decks are separated vertically by eleven feet and the well-signed internal ramps will provide interior circulation between decks without interference with the outside arterial street traffic.

A customer will have no trouble remembering where his car is parked. Parking areas are divided into seven zones, each with its own color. The column caps of each zone will be painted the distinguishing color, so the shopper need only remember his color and row number.

Traffic Signs

All entrance signing will be reflectorized with orange background. Green background signs will direct customers to the various exits.

Columns at the end of each aisle of the color coded parking areas will have silver reflectorized numbering with arrows reverse screened the color of that parking area.

The arterial lanes between the various parking areas will be clearly designated by the columns being painted bright yellow, center-line striping on the surface, and the fluorescent overhead lights of a deluxe-yellow color oriented end-to-end along the lanes. The fluorescent illumination of the covered parking lots will, on the other hand, be of a daylight color and spaced at 16 foot centers. A customer can quickly ascertain location of the arterial exit lanes from either inside or outside his vehicle.

Truck Concourses

The concept of a truck concourse to eliminate the conflict of heavy vehicles with passenger vehicles and customers; to remove loading, delivery, garbage and trash collection; to provide eco-

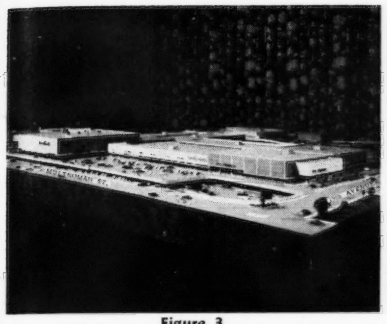


Figure 3
Lloyd Center model view looking N.W. from Multnomah Street at 15th Avenue—showing surface entrances directly to two parking levels.

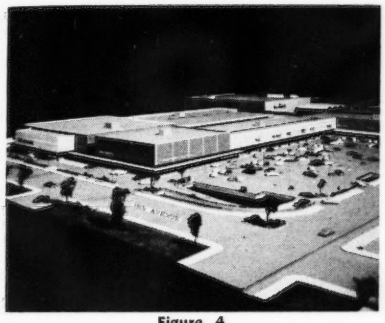


Figure 4
View from Halsey at 15th Avenue looking S.E. showing the enclosed ramps for customer movement from this, the mall level, to either the intermediate or Multnomah levels or to the tunnel under 15th Avenue (scheduled by City as a one-way street) and to the 16th Avenue (the other one-way street of the couplet).

nomical and readily accessible passageways for utilities, and to further reduce overall construction cost; was first developed in the Northgate Center in Seattle. This concept has been followed in the design of the Lloyd Center with an added concept founded upon providing proper service facilities to a multilevel shopping center with multilevel parking. The truck concourses include both underground and upper deck services. The upper deck truck concourses are dead-ended with truck turntables to enable the return trip of service vehicles.

Illumination

The covered parking (Multnomah and intermediate levels) will be illuminated to a maintained level of five foot candles with fluorescent fixtures.

The surface and mall level parking will be illuminated with mercury vapor luminescence to a maintained level of two foot candles.

Vehicle Tunnel

The City of Portland plans include future designation of a one-way couplet on 15th and 16th Avenues, abutting Lloyd Center. To expedite both the access and egress of customers and to reduce arterial interference, a vehicle tunnel is designed in this project under 15th Avenue. This tunnel leads to 16th Avenue and eliminates at-grade crossing of heavy arterial traffic.

Traffic

At present, a one-way couplet to the east, Grand and Union; Broadway, abutting Lloyd Center on the north; Lloyd Boulevard on the south and 15th Avenue on the east are arterials carrying the major traffic. The streets inside this cordon carry nominal traffic.

Lloyd Center will attract 24,000 vehicles during the peak open-evening day of an average week. These volumes added to the present high peak volumes would exceed practical capacity.

The cooperative approach to the problem by both Portland City officials and the Oregon State Highway Department was exceptional in many details that will assure adequate access and egress provisions without a detrimental effect on arterial traffic.

These provisions include:

1. Permits for surface access to all the abutting streets. (These, incorporated with the internal ramps between the various parking areas, permit direct access or egress flow with reduced conflicting maneuvers on the arterials.)

2. Provision for a one-way couplet on 15th and 16th Avenue, east of Lloyd Center.

3. Permits for a vehicle tunnel from the Multnomah parking deck under 15th Avenue to 16th Avenue, accommodating the one-way street couplet.

4. Design location of the 16th Avenue Bridge over the Banfield Expressway to the 15th-16th Avenues couplet.

5. Ramp design for westbound traffic on the Banfield Expressway to and from the proposed 16th Avenue Bridge.

6. Off-ramp design for eastbound traffic from the Banfield Expressway to the Lloyd Center area.

7. Lloyd Boulevard extension design grade-spearated from the Banfield Expressway off-ramp and the 16th Avenue Bridge.

8. Improvement and extension of a one-way couplet, Union and Grand, carrying north-south traffic.

9. Planning for other one-way street couplets about Lloyd Center to expedite movement to and from more remote areas of the City.

Metropolitan Effect

The City Planning Commission's conclusion, after extensive study, reflects the effect that can be anticipated from the first regional shopping center centrally located and proximate to the Central Business District.

The Commission concluded:

1. The proposed development of the Lloyd Corporation will benefit the City and should be encouraged in all ways possible.

(Continued on page 38)

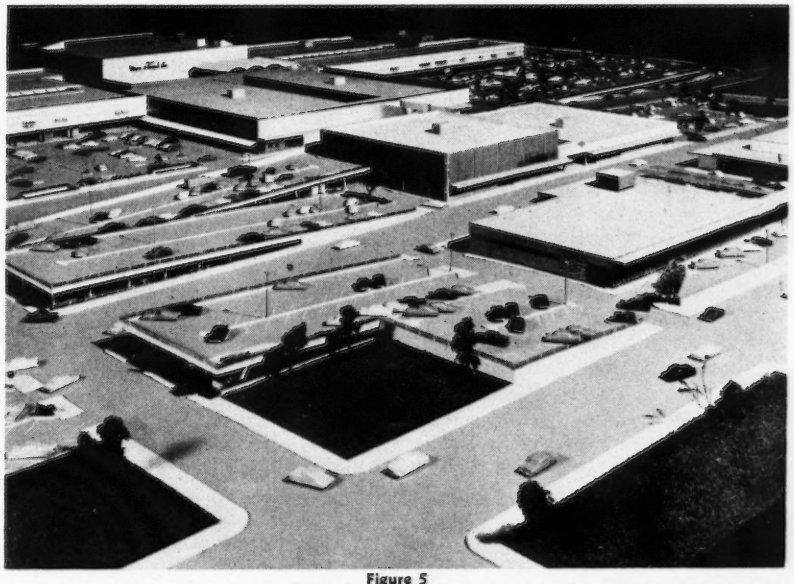


Figure 5
This model view looking S.E. from Broadway and 15th Avenue shows the scissor parking arranged to give direct access from surface streets, light to the lower level parking and (adjacent to Newberry) use of the inclined parking area as a ramp to the top deck truck concourses. This Newberry Store is one of their largest operations with over 93,000 square feet of store space.

Highway Lighting — A Feature of Modern Roadway Design

by W. E. Schwanhausser, Jr.
(Assoc. Mem., ITE)
Manager, Application Engineering,
Outdoor Lighting Department,
General Electric Company

PLAN AHEAD! Build roads that will be adequate for travel in 1975—almost 20 years from now! This is a great challenge, to be sure, but it is also a marvelous opportunity to contribute to a better way of life for everyone who will use our roads in the years to come.

What can we do today that will still prove adequate more than a decade from now? How can we build a road of the future, today? Such are the thoughts and problems of our state highway departments and the engineering profession. Among the many design features to be considered in this task, one stands out as a must for many locations — effective highway lighting.

Why Highway Lighting?

There are three basic reasons why highway engineers are rapidly realizing the necessity for highway lighting at certain locations. These can be identified as S - E - C, standing for Safety, Efficiency and Comfort, all interrelated. Let us look at each one of these items separately.

1. Safety.

As an example of the accident reduction that can be obtained with adequate highway lighting, there was a report in TRAFFIC ENGINEERING sometime ago on results obtained in Detroit. Unlighted highways with full control of access as well as those with no control had about twice the number of fatalities at night as by day, yet traffic during hours of darkness was only one-third the daytime volume. On the other hand, night fatalities on the lighted Davison Expressway represented only 40 per cent of the total, which was more in line with the actual volume of traffic. Here is just one of many indications that adequate lighting can help to make our highways safer.

Statistics year after year show that 55 to 60 per cent of our accidents occur during hours of darkness when vehicular volumes are greatly reduced. There are many reasons for these figures, but the inability of the driver to see what lies ahead is frequently a predominant factor in night accidents. Headlights, even under ideal conditions, fail to provide sight distances of more than 400 feet. That isn't very far for the modern car on a modern highway.

We must also remember that approximately 60 per cent of the accidents on roads with full control of access involve rear-end collisions or sideswipes, as reported by C. W. Prisk in the November 1956 issue of TRAFFIC ENGINEERING. He goes on to say: "In this connection, points of entrance and departure are critical ones, and further design refinements are needed on ingress and egress facilities."

Good lighting will give the driver his sorely needed better vision during hours of darkness. Adequate lighting should also give him added time by increasing his sight distance. Both of these factors provide the driver with better facilities for safer travel on our modern highways and can be brought about through proper lighting.

2. Efficiency.

Let us look at the efficiency — or, better yet, the utilization—of the highway. This is where we need more facts to prove opinions. Traffic engineers can help provide statistics on the effect of lighting on roadway capacity and utilization. In Texas, Professor Jack Keese has undertaken a research project to develop a procedure for studying vehicle operation under varying degrees of roadway illumination.

A man who has contributed so much to roadway capacity studies, O. K. Normann, has obtained some comparative data on lighted and unlighted highways in the Detroit area. When computer time permits, he will be able to report his findings on headways, speeds, lane usage and lateral spacing of vehicles on comparable sections of lighted and unlighted highways.

Mr. Normann has also conducted some studies on the new Connecticut Turnpike, opened without benefit of lighting. "After" studies on the same roadway — now continuously lighted over a fifty-mile stretch—should show interesting comparisons.

The January 1958 issue of TRAFFIC ENGINEERING contained an article by Paul Box on "The Effect of Highway Lighting on Night Capacity." The results indicate that lighted highways have a greater night capacity than unlighted highways. Mr. Box' studies failed to indicate any effect on the speed of vehicles, although this may have been the effect of the study site. He made a strong plea for additional studies, especially under conditions of higher traffic densities and higher levels of illumination. He urged that studies be made at illumination levels of 1 to 2 footcandles instead of the 0.8-footcandle level available for this study, for he felt this was too low for the higher density of traffic. He expressed the belief that under higher levels of illumination, studies would show an even greater significance.

What data are available, then, indicate that highway lighting helps to preserve capacity. Although supporting evidence is not at hand, illumination should also provide higher safe speeds at night. Currently recommended night speed limits below daytime limits are the result of reduced visibility—lighting would probably eliminate the need for such lowered limits.

3. Comfort.

Connecticut is certain that its new

Figure 1
Asbury Avenue entrance road merging into Garden State Parkway, New Jersey.

Turnpike will provide more comfortable driving since it will, to a large degree, reduce the discomfort and fatigue of driving against oncoming headlights. By providing improved visibility, the driver will not overdrive his headlights and the fixed lighting will thereby reduce the strain of trying to pierce the darkness of the road ahead. All of these factors should reduce the wear and tear on the driver, making him less liable to accidents, and thus making for greater safety.

It is also felt that making the roads more comfortable at night for the motorist will encourage more people to travel at night. This may well level off the peaks of highway usage and fill in the valleys that now occur during hours of darkness.

As more and more highway lighting is installed, we will be able to obtain more facts just as we have been able to collect data to prove the advantages of higher design standards on our freeways.

Where is Lighting Applied?

You may well ask if I mean to imply that we should provide continuous lighting on all our highways. No —not by a long shot. At least for the present, you will find that continuous lighting will prove desirable largely in urban areas where traffic volumes are high and where interchanges and access points appear at frequent intervals. Let's look at some of these areas where lighting can be effectively applied to our modern highways.

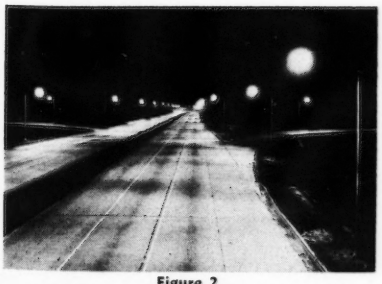


Figure 2
Edens Expressway, Cook County, Illinois.

Access Roads and Acceleration Lanes

It is on the access ramp (Figure 1) that we have our first serious hazard—the possibility of a sideswipe or rear-end collision. This hazard can be greatly reduced if the drivers are able to see each other and estimate each other's approach speed.

To accomplish this, we are going to depend upon discerning objects by surface detail. This will require a maintained average level of lighting on the roadway of about one footcandle. This lighting should be provided on the approach road or ramp as well as on the acceleration lane itself.

We cannot stop our roadway illumination abruptly; it must either be continued or tapered down gradually. If we fail to continue the lighting and suddenly discontinue it, drivers may be blinded as they leave the illuminated area and enter the dark area. This tapering off does not need to be carried to extremes, but the design should be practical.

Although it is recommended that the level of lighting be built up gradually on an approach to a lighted area, it must be remembered that the eye adapts to a higher level of illumination a great deal faster and easier than it does to a lower level. In many cases where the acceleration lanes for two opposing roadways are opposite or close to each other, the "tapering down" lighting for one roadway will help serve as the "build up" lighting for the other roadway.

Straight Sections— Continuous Lighting

As we leave the acceleration lane and merge into the main flow of traffic, the lighting level may be decreased slightly. A minimum of illumination will be found in lightly traveled and rural areas. In urban areas, however, the situation is entirely different.

Even the experts find it hard to reach complete agreement on the details or factors that justify continuous lighting. It is logical to conclude, however, that adequate lighting should be installed in areas where the possibility of conflict is high, or where improved visibility will make the driving task safer, more comfortable and less fatiguing.

Where illuminated sections such as interchanges are located at less than one - mile intervals, it is generally agreed that continuous lighting should be installed.

Traffic density, especially where it exceeds the IES-ASA classification of "heaviest" (over 4,000 vehicles per hour in both directions for the maximum night hour), is certainly another factor to be seriously considered. Even when the volume of traffic is classified as "heavy" (1,200 to 2,400 per hour), continuous lighting may be felt to be justified.

Rural Four-Lane Design

A very popular roadway design on the Interstate System is expected to be a four-lane divided roadway with a 36-foot median and 10-foot shoulders. Although this design is generally classified as rural, it will appear in suburban and some urban areas. In some rural areas the median may exceed 36 feet. Regardless, each two-lane roadway should be lighted independently of the other.

The minimum level of maintained illumination should be at least 0.8 footcandle. Where high-density traffic is experienced for appreciable periods of time, levels of one to two footcandles may prove highly desirable. In any event, the luminaires should be centered over the pavement. This will require the use of rather long (12-foot) mast arms since the pole must be located outside the shoulder and therefore more than ten feet from the pavement.

Urban Four-Lane Design

When we get into urban areas where the acquisition of right of way becomes very expensive, the median will very likely shrink. A 4-foot minimum has been specified for the Interstate System. Immediately one may be tempted to place twin light standards down the center of the median. Certainly this is the most economical arrangement insofar as installation costs are concerned. It is also a practice which has been very popular in the past. Unfortunately, with relatively narrow medians it is a practice which greatly increases the accident hazard. It is desirable to maintain at least a four-and-a-half-foot clearance (more if possible) between the roadway edge and any obstruction such as a light standard.

The maintenance problem must also be considered. If the luminaires were

Figure 3
Dallas Expressway, Dallas, Texas.

supported from the median, service crews would be forced to expose themselves to the dangers of high-speed or passing-lane traffic. When the poles are located outside the shoulder or curb line, far greater protection is provided. Consequently, when narrow medians exist, the recommended practice is to place the supporting standards beyond the outside curb or just outside the shoulder. (Figure 2). If a barrier curb exists, the poles should be placed back about four or five feet from the edge to provide adequate clearance between moving vehicles and the mountings.

Urban Six-Lane Design

As the highway approaches the more heavily populated metropolitan centers, the width of the roadway may increase from four to six lanes. Where six lanes are involved with a barrier-type curb, as in Figure 3, the long mounting bracket still proves desirable in order to get the luminaire out over the roadway where it is most effective.

Urban Eight-Lane Design

In some of the most densely populated areas, eight-lane roadways may be used. Rights-of-way for such construction are at a premium, dictating rather narrow medians.

Whenever narrow medians are encountered, the lighting system should be designed as if the median did not exist. The mounting of luminaires in the median is emphatically discouraged, as indicated earlier. It is conceivable, however, that where a moderate median exists — thereby reducing the accident hazard — an installation of twin-light standards combined with long mast arms may be tolerated (Figure 4). Certainly this form of construction is more economical as far as pole and cable costs are concerned. Note, however, that the mast arms must be long enough to get the luminaires out over the edge of the pavement.

Figure 4
US 99 at Fort Lewis, Washington.

At-Grade Intersections

One of the main features of the new Federal Highway System is to eliminate intersections and grade crossings. There is still a possibility, however, that in some remote locations grade crossings will be permitted, even if frowned upon. Such locations, if for no other reason than that they are so unusual, will represent a hazard requiring adequate protection.

On highways not built as part of the new System, intersections will continue to be a normal design feature.

In accordance with the best engineering practice, a left turn lane — or slot — will be cut into the median for the protection of those vehicles waiting to make a turn to the left. The

D. GRANT MICKLE CITATION

as Second Recipient of the

Theodore M. Matson Memorial Award

Miami Beach, Florida November 11, 1958

D. Grant Mickle has made outstanding contributions to traffic engineering — in enlarging its scope, upgrading professional standards, and securing for it adequate recognition and status in government at all levels.

He has pioneered in studies of how government at the municipal and metropolitan levels can effectively meet modern traffic and transportation needs. Management surveys made under his direction have resulted in the establishment of a department of streets and traffic in Detroit and in strengthened organization in Los Angeles, Washington, and other cities. These surveys have emphasized the importance of broader and higher concepts of traffic engineering service generally.

Mr. Mickle has done much toward improving and extending traffic engineering education and training. He has lectured in many courses and has exerted strong influence on strengthening and enriching the content of courses of study. He has counseled public officials and others on traffic engineering in other countries as well as throughout the United States. He has conceived and given leadership to many pioneering programs for the advancement of the profession, notably through distinguished service to the Highway Research Board and other technical groups.

Mr. Mickle, since 1943 the Director of the Traffic Engineering Division of the Automotive Safety Foundation, began his distinguished professional career in 1931. He served, in turn, the Massachusetts Department of Public Works, the U. S. Bureau of Public Roads, the Michigan State Highway Department and the City of Detroit. His work included highway planning, transport surveys and traffic engineering.

Mr. Mickle is a past president of the Institute of Traffic Engineers, a member of the American Society of Civil Engineers, the American Public Works Association, the American Society of Planning Officials and numerous technical committees. He received the David Beecroft Award for outstanding service in behalf of traffic safety.

Eminent in his many practical and far-sighted contributions to advancement of the science of traffic engineering, it is appropriate that D. Grant Mickle be the second recipient of this Award.

Figure 5
Philadelphia, Pa., Industrial Highway.

Figure 6
Intersection on Long Island, N. Y.

lighting system should assist the driver in locating this left turn lane and should reveal other vehicles or pedestrians in the area. The installation shown in Figure 5 may well prove to be typical.

Interchanges

Far more numerous and characteristic will be the interchanges designed to eliminate at-grade intersections. Interchanges take many forms, ranging from rather simple varieties to complex and sometimes (to drivers) mystifying mazes. Their design is, of course, dictated by many factors such as the terrain and even right-of-way acquisition costs.

Certainly the more important interchanges with high traffic densities should be lighted as is the one pictured in Figure 6.

In a somewhat simpler type of intersection, lighting will also frequently be installed. In a conventional cloverleaf, poles are located well back from the edge of the pavement, beyond the shoulder. (Figure 7). Long mast arms place the luminaires out over the edge of the pavement. An attempt has been made to keep the poles away from the bifurcation or actual division point of the exit road with the main roadway. This is done in order to make the supporting standards a little less vulnerable to the unfortunate driver who may be forced into a compromising situation or who may change his mind at the last moment — just a little too late.

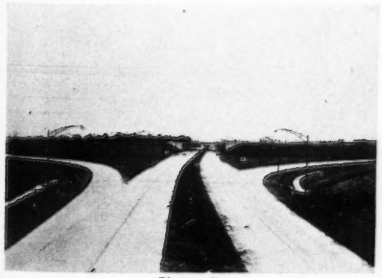


Figure 7
Cloverleaf at State 100 and US 40 near Indianapolis, Ind.

Illuminated Signs

For those who regularly travel through even the most complex interchanges, the maze offers few problems and confusion seldom results because the route is familiar. The stranger who does not know exactly where he wants to go can thoroughly snarl traffic, however.

With design speeds of many of the new roads in the neighborhood of 50 to 70 miles per hour, the importance of proper and adequate signing cannot be over-emphasized. An indecisive motorist, floundering about in dense or high-speed traffic, trying to determine which roadway he wants to take, can very well be the cause of an accident, or at best, a large number of jangled nerves. It is bad enough navigating around some unfamiliar complex interchanges during daylight hours, to say nothing of the problems of travel after dark.

Many engineers have found that "king size" signs mounted above the roadway prove particularly effective in directing drivers into the proper lane or roadway. These large signs are clearly and easily seen during hours of daylight.

To help make the signs more visible and effective at night, it has been found highly desirable to provide permanent illumination. (Figure 8).

It is not the average driver but the sub-average driver who causes trouble. We must do everything we can to help even that small percentage—because the troubles they cause can involve many other drivers.

Structures

Underpasses, tunnels and bridges are all logical locations for lighting. Many outstanding examples exist today of lighting applications to such structures, and volumes could be written on the subject. The Illuminating Engineering Society has had a sub-committee at work on a standard for tunnel

Figure 8
North-South Highway in Louisville, Ky.

lighting, and information is available on this problem, as well as others.

Conclusion

Let's all plan ahead. Of course there will be new tools, new luminaires—perhaps even new light sources—before 1975 rolls around. Twenty and thirty years ago, progressive roadbuilders moved ahead without waiting for new light sources to be fully developed or improved. They used the tools at hand. We must do likewise.

When the George Washington Bridge was built across the Hudson River in the early Thirties, filament lighting—typical of the era—was installed in pendent fixtures. Although we now, two decades later, consider this inadequate lighting, it served the purpose until added roadway capacity became essential. A fairly recent installation of 400-watt mercury luminaires provides an average illumination of almost two footcandles, and will last for at least a generation.

California offers another example of forward thinking and planning. The Golden Gate and Bay Bridges were built in the mid Thirties, just a little after the George Washington Bridge. A new light source, sodium vapor, had appeared on the horizon. It showed promise as an effective highway lighting tool and therefore was put to work in lighting both these bridges. When the bridges first opened for business, some Doubting Thomases felt that the lighting was just a little rich. Was all that light needed?

(Continued on page 38)

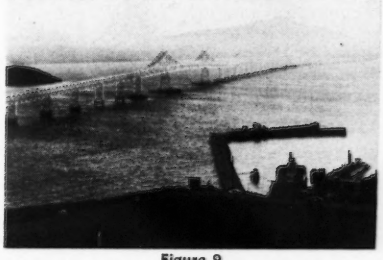


Figure 9
Richmond-San Rafael Bridge near San Francisco, California.

The Use of Yield Signs and Illuminated One-Way Signs in San Diego

By Martin J. Bouman
(Associate Member, ITE)
Associate Traffic Engineer, City of San Diego, California

This article was originally in the form of a paper presented at the Annual Meeting of the Western Section of the Institute of Traffic Engineers in Denver, Colorado, June 1957. The figures have been revised as necessary to be factual as of August 1958.

Yield Signs

IT WOULD APPEAR that by this time practically every city, county and state traffic engineer has had some experience with the use of Yield Right of Way signs.

San Diego is continuing to experiment with "Yield" signs and has discovered what appear to be some unique and effective methods of utilizing this relatively new means of intersection control.

At the present time there are 116 "Yield" signs at 75 locations in San Diego. There are 89 locations at which the signs have been in place a year or longer—enough time to make before and after comparisons. We find that at these 89 locations, the record shows 64 accidents in the year previous to installation as against 28 accidents in the year following. Seven locations showed a slight increase (one accident). All the others experienced either a decrease or no change.

Our unique installations of the "Yield" sign stem from the common problem of how to control intersection conflicts at a location where the heavy traffic flow makes a turn from one street to another. Frequently there is sufficient cross-conflict to require controls—yet insufficient cause for stopping one or both legs of the major traffic flow.

What To Do?

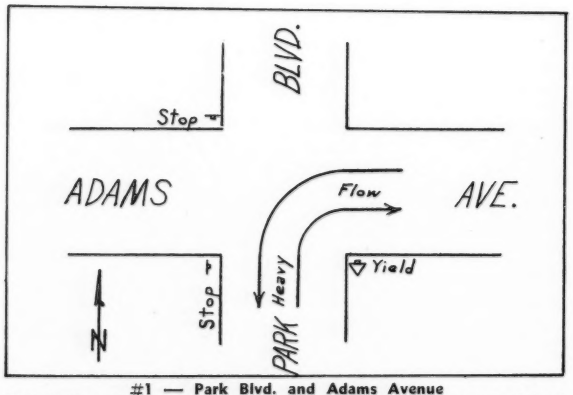
For a number of years San Diego had an unusual solution to the problem in a sign reading, "Caution — Right Turn Keep Moving." This sign was erected immediately below the "Stop" sign affecting the heavy traffic move making a right turn. In some cases "Stop" signs were also in place for other approaches to the intersection. About three years ago however, the "Caution—Right Turn . . ." sign was declared illegal when erected with the more positive controlling "Stop" sign, and its use was discontinued. In its place however, a "Yield" sign requires the light through movement to yield to the heavy left turn which it must cross, while the heavy right turn can move unimpeded at speeds up to 15 MPH.

Following are a few sketches and photographs showing typical installations.

The results of the special applications of "Yield" signs have been gratifying thus far. We are, in fact, planning other similar installations and urging other communities to do likewise. We are aware of some criticism for using "Yield" signs and "Stop" signs at the same intersection. We have been accused of confusing the motorist —even of making an illegal traffic control installation. Our experience however is that the system is most satisfactory. In over three years there have been no complaints, either of a technical or legal nature. The record speaks for itself.

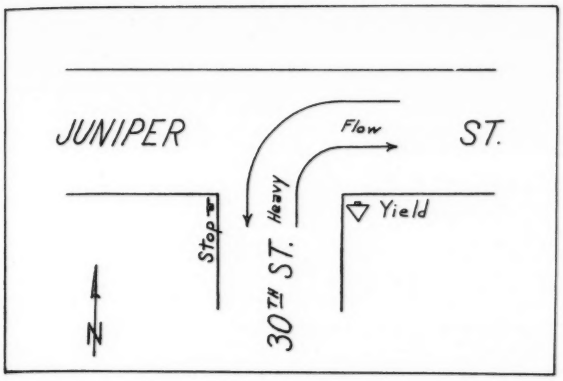
Illuminated One-Way Signs

Recently an innovation was added to the streets of San Diego — illuminated one-way signs. Consideration was first given to these signs when it was decided that the entire central business district, comprising some 16 north-

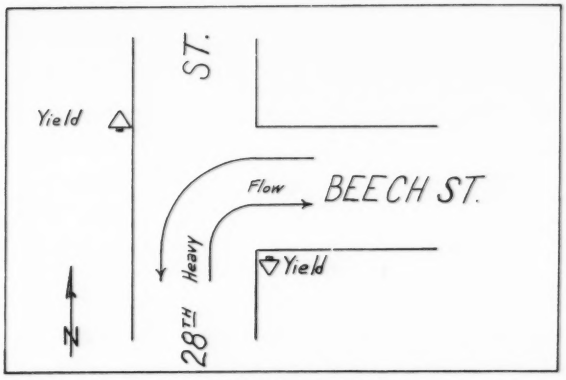


#1 — Park Blvd. and Adams Avenue
This is the most common pattern used. The heavy movements (about 5,000 vehicles daily) are the right turn from northbound to eastbound and the reverse left turn from westbound to southbound. Note that the two minor approaches are controlled by "Stop" signs.

Looking north on Park Blvd. Note the turning vehicles and pavement stains showing the heavy movements.



#2 — 30th St. and Juniper St.
This is similar to the previous pattern except that this is a T-intersection.



#3 — 28th St. and Beech St.
Here again the heavy movements are north to east and west to south. At this T-intersection however, traffic on the minor leg is extremely light and visibility is excellent — thus a "Yield" was used on that approach rather than a "Stop."

Looking east on Juniper Street (the minor movement) showing the "Stop" sign. "Yield" sign is barely visible on street name sign standard at gas station. (The gadget on the fire plug is a water pressure tester.)

Looking north on 28th Street. Note large truck making the heavy right turn. This is also a heavily traveled bus route.

south streets and seven east-west streets, would be converted to a one-way grid-iron pattern, eventually to include over 150 signalized intersections. Convinced by the experience of other cities that illuminated one-way signs were highly desirable, we set out to design a proper sign. Four major specifications had to be met: (1) the sign had to be rugged; (2) the sign had to resemble the standard one-way arrow; (3) the sign had to be post-top or side mounted (no cable or mast-arm suspension); and (4) the sign had to be inexpensive.

In our final design, we believe we accomplished the above objectives. The signs are of an aluminum box construction and very strong structurally. The box is 12 inches high by 36 inches wide by 6 inches deep. Both single and double faced boxes were specified. Illumination is provided by a 25 mm cold cathode, u-shaped lamp.

Shown on the next two pages are standard drawings which cover details. Contract specifications for the signs are as follows:

D-08 Illuminated One-Way Street Signs:

The illuminated sign unit shall be of a box type design 36″ wide by 12″ high by 6″ deep with a 35¾″ by 11¾″ by ⅛″ translucent white acrylic plastic panel on the front. The sign panel shall be illuminated by a cold cathode tube mounted within the sign cabinet.

The cabinet shall be constructed from sheet aluminum of the grade known as 2S ½ had of a thickness of .081 inches. All screws, nuts, rivets and similar fittings shall be made from non-ferrous materials.

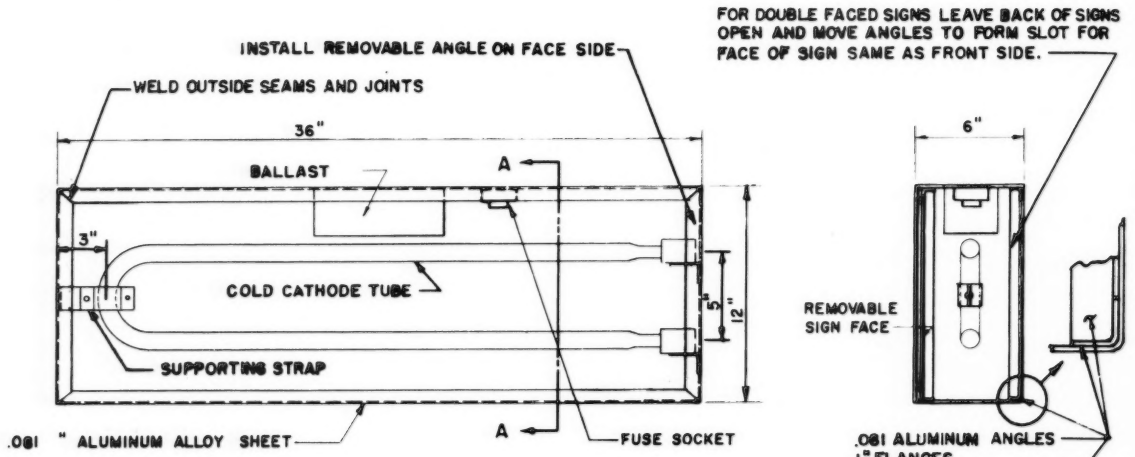
The cabinet shall be constructed with all outside joints mitered and welded and all outside seams welded so as to be watertight. Interior angle stiffeners shall be spot welded to the cabinet.

The acrylic plastic panel of the type shown as W2254 Plexiglas shall be installed so as to be removable by sliding out of the right hand edge of the cabinet. Angles placed to form the slide grooves for the plastic panel must be spaced to provide free sliding without binding.

Removable angles shall be installed at the right hand edge of the sign to permit removing sign faces and shall attach to the cabinet by two thumb-screws with 8-32 threads. Clearance holes shall be drilled through the cabi-

Photo shows illuminated sign in comparison to standard one-way sign. Illuminated sign is mounted at 10 feet, standard sign at seven feet.

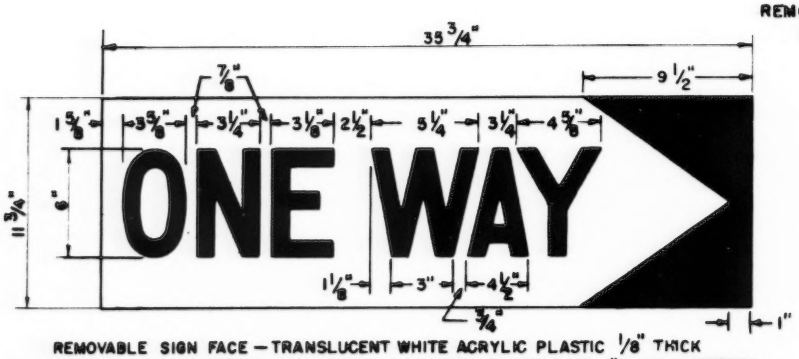
PAINT ALL METAL PARTS WITH I COAT OF METAL PRIMER.
PAINT EXTERIOR SURFACES WITH 2 COATS OF FLAT BLACK ENAMEL.
PAINT INTERIOR SURFACES WITH 2 COATS OF FLAT EGGSHELL WHITE ENAMEL.



ELEVATION VIEW

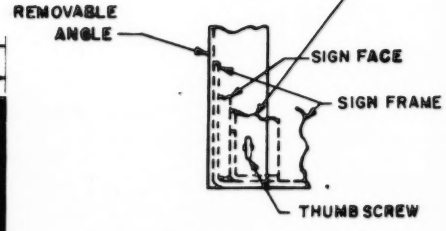
FOR DOUBLE FACED SIGNS LEAVE BACK OF SIGNS OPEN AND MOVE ANGLES TO FORM SLOT FOR FACE OF SIGN SAME AS FRONT SIDE.
6"
REMOVABLE SIGN FACE
.081 ALUMINUM ANGLES 1" FLANGES

SECTION A-A



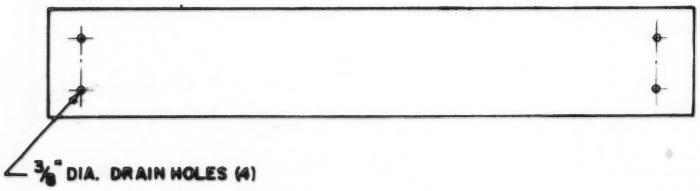
REMOVABLE SIGN FACE — TRANSLUCENT WHITE ACRYLIC PLASTIC 1/8" THICK WITH BLACK LETTERING AND ARROW ON WHITE BACKGROUND. 1" WIDTH LETTERS PAINTED ON OUTSIDE FACE.

RIGHT HAND SIGN



VIEW AT RIGHT HAND SIDE SHOWING REMOVABLE ANGLE

LEFT HAND SIGN
(DIMENSION LETTERS SAME AS OPPOSITE HAND)

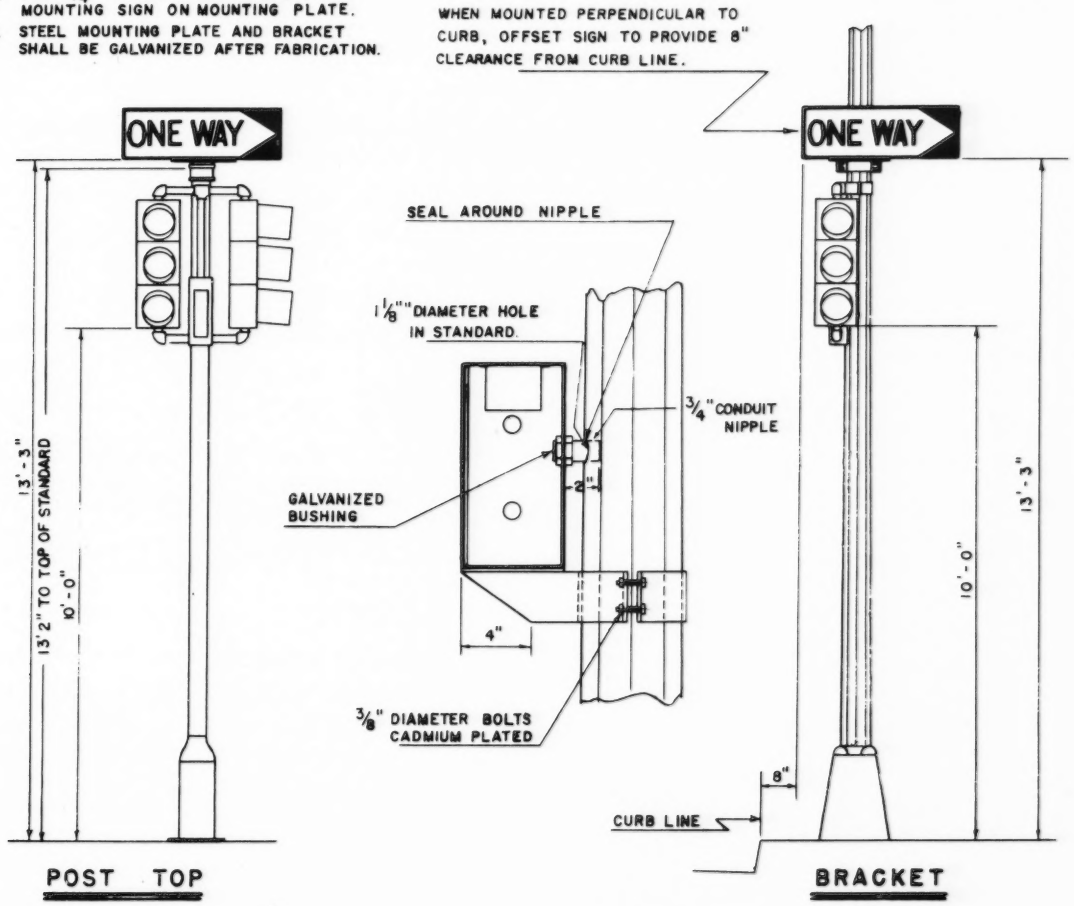


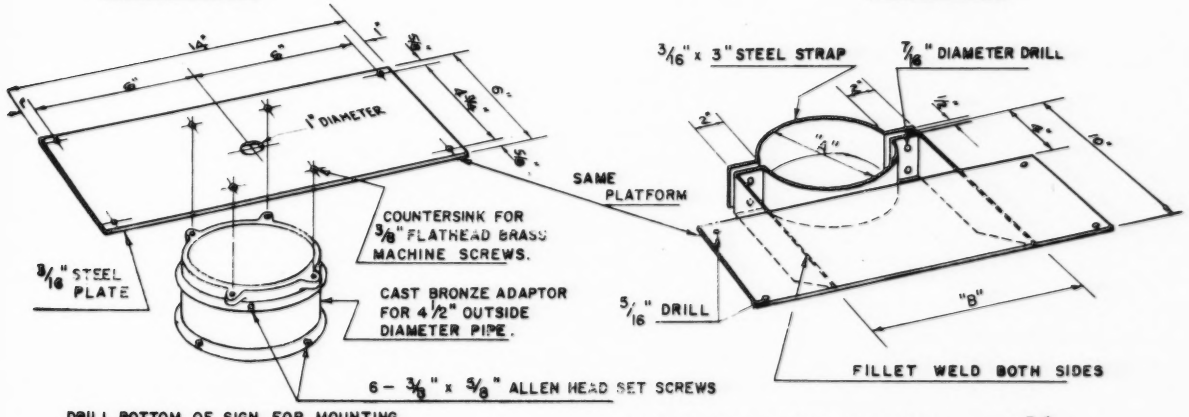
BOTTOM VIEW OF SIGN

SIGN DETAILS

NOTE :

1. USE 1/4" BRASS MACHINE BOLTS FOR MOUNTING SIGN ON MOUNTING PLATE.
2. STEEL MOUNTING PLATE AND BRACKET SHALL BE GALVANIZED AFTER FABRICATION.




1" DIAMETER
3/16" STEEL PLATE
COUNTERSINK FOR 3/8" FLATHEAD BRASS MACHINE SCREWS.
CAST BRONZE ADAPTOR FOR 4 1/2" OUTSIDE DIAMETER PIPE.
6 - 3/8" x 3/8" ALLEN HEAD SET SCREWS
SAME PLATFORM
3/16" x 3" STEEL STRAP
7/16" DIAMETER DRILL
5/16" DRILL
"B"
FILLET WELD BOTH SIDES

DRILL BOTTOM OF SIGN FOR MOUNTING BOLTS AND WIRE ENTRANCE IN FIELD.

DIMENSION "A" FOR TYPE X STANDARD ——— 5 3/16"
DIMENSION "A" FOR CONVERSION STANDARD — 6 7/8"
DIMENSION "B" FOR TYPE X STANDARD ——— 10"
DIMENSION "B" FOR CONVERSION STANDARD — 11 1/8"

MOUNTING DETAILS

net and removable angle for the thumbscrews which shall thread into stiffener angles.

Illumination shall be provided by a 25 mm 4500 degree white cold cathode lamp. The lamp shall be made of lead glass with 6 mm pressure and shall be bent from a straight length into a "U" so that the ferrule bases are spread 5" center to center. It shall be mounted so that the lamp is supported by two metal brackets and rubber mounting rings.

Lamp sockets shall be a push contact lampholder designed so that circuit cannot be completed until lamp pins are set in correct position. Socket shall be suitable for the type and size of lamp used and shall be molded of white thermosetting plastic. Contact shall be spring supported with a minimum travel of one-half (½) inch. Thermal screws shall be covered with insulating plates. Sockets shall be securely attached to the sign frame. Sockets shall be rated at 660 watts and 1000 volts.

The lamp shall be supplied through a cold cathode ballast having a secondary current of 120 M.A. and a minimum power factor of 90 per cent when operating at 85 to 130 volts.

The ballast shall be mounted to the cabinet with four #10-24 brass machine screws. Lead washers shall be used under screw heads.

All wiring shall be securely held in place by suitable fasteners and shall terminate in a terminal block for ready connection.

A screw-base plug type fuse shall be mounted in the circuit within the sign cabinet.

All metal parts shall first be degreased and thoroughly cleaned and then primed with one coat of a metal primer. Two coats of flat eggshell white enamel shall then be applied to the interior of the cabinet and two coats of flat black enamel to all exterior surfaces.

The legend "One Way" shall be imprinted on the exterior side of the translucent white acrylic plastic (outdoor, weather-resistant type) panel by the silk screen process. This legend shall be imprinted by applying one coat of black acrylic-base, plastic process paint. When the legend is thoroughly dry, the interior and exterior of the plastic panel shall be cleaned and waxed with an approved anti-static liquid wax. Double faced signs shall have legends pointing in same direction on both sides of sign.

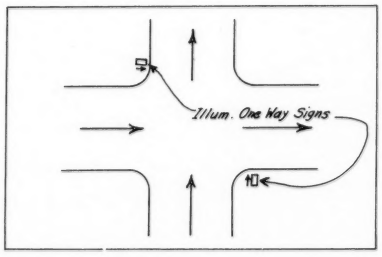
Typical signal post top mounting. Sign is 13 feet high here.

The contractor shall supply to the city for inspection and approval one complete sample sign panel before proceeding with the manufacture of additional sign panels.

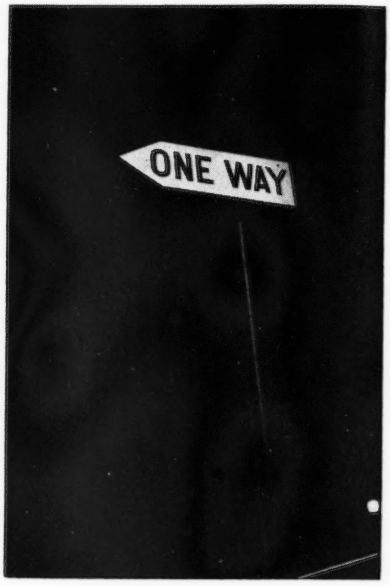
At the present time, 175 signs have been purchased at a cost of $13,511, or about $77.00 each, installed. The signs were manufactured and installed by Ets, Hokin and Galvan, a local electrical manufacturer and contractor.

The sketch shows a typical installation at the intersection of two, one-way streets.

At the outset, all signs, both signal post and straight post, were mounted at 13 feet. There was considerable criticism of this however, since the straight post mounts at 13 feet had a high, awkward appearance. The straight post mounts have since been lowered to ten feet—Signal mounts are still above the signal head at 13 feet, due to a number of other signal appurtenances occupying vertical space on the signal post below the head.



Generally, the signs have had favorable acceptance. We expect in the near future to install 130 more, with no major change in design.



A night view of the sign.

Training Opportunities

1959

January 28-30—FREEWAY OPERATIONS SEMINAR—
The fifth in the current series of Freeway Operations Seminars will be held at the Bon Air Hotel, Augusta, Georgia under the sponsorship of the Southern Section of the Institute of Traffic Engineers. Traffic engineers, planners, design engineers, traffic police supervisors and others with responsibility now or in the future for the planning, design or operation of controlled access facilities are invited. For reservation forms and additional information, contact W. S. Derrick, c/o Georgia State Highway Dept., Atlanta, Ga.

February 2 - 4—FREEWAY OPERATIONS SEMINAR—
The sixth in the current series of Freeway Operations Seminars will be held at the Western Hills Inn, Euless, Texas (halfway between Dallas and Fort Worth) under the sponsorship of the Texas Section, ITE. Planners, engineers, and enforcement supervisors who will have responsibility for planning, designing or operating controlled access roadways are invited. For reservation forms and further information, contact T. Robert Buckman, 950 Jennings Street, Fort Worth, Texas.

March 2-20—TRAFFIC ENGINEERING SEMINAR
Sponsored by Northwestern University Traffic Institute and the Midwest Section, ITE. For traffic engineers and others with engineering backgrounds. Tuition $195. For information, address: Northwestern University Traffic Institute, 1704 Judson Ave., Evanston, Ill.

Graduate Programs in Transportation Engineering

An Analysis of Their Content and Need

By Donald S. Berry
(Member, ITE)
Professor of Civil Engineering
Northwestern University, Evanston, Illinois

This article is adapted from a paper presented at the annual meeting of the American Society for Engineering Education held in Berkeley, California, June 16, 1958.

INFORMATION on the current status of graduate programs in transportation engineering was solicited from 19 universities during May, 1958. The schools solicited were those which had furnished information for a study of graduate work in traffic engineering for the year 1956-1957.*

Replies were received from 19 universities, with results summarized in Tables I and 2. Table I indicates that there were 283 graduate students majoring in some phase of transportation engineering at these 19 schools during the spring of 1958, with 185 working toward the Master's Degree and 31 working for their Doctorate. Several of the schools, including Purdue, Ohio State, Northwestern, and Yale, had numerous students enrolled in graduate work, but not working for a degree. Many of these were foreign students sponsored by the International Road Federation.

Table I indicates that most of the graduate students were majoring in the highway or traffic engineering areas. Thirty-nine per cent of the students were reported as majoring in highways (including materials), with 56 per cent majoring in highway planning or traffic engineering. Only nine of the total of 283 graduate students were reported as majoring in general transportation engineering or in transportation areas other than highways.

TABLE I

GRADUATE STUDENTS MAJORING IN TRANSPORTATION ENGINEERING, SPRING, 1958

University	No. of Grad. Students for M.S.	Ph.D.	Spec.	Major Interest of Graduate Students Hy. Materials	Hy. Plng. & Traffic	Other
Brooklyn Poly.	15	—	—	3	12	
Univ. Calif.	20	5	—	3	20	2 (Air Transp.)
Cornell	7	—	—	4	1	2 (Gen. Transp. Eng.)
Georgia Tech.	5	—	—	4	1	
Univ. Ill.	10	2	—	9	3	
Iowa State	5	3	—	5	3	
M.I.T.	10	1	—	2	4	5 (Photogrammetry)
Univ. Mich.	14	1	—	7	6	2 (Airports)
Mich. State	7	1	1	—	9	
N. C. State	7	—	—	1	6	
Northwestern	12	1	3	3	11	2 (Gen. Transp. Eng.)
Ohio State	12	—	12	18	6	
Purdue	27	9	9	30	15	
Penn State	1	1	—	1	1	
Texas A. & M.	16	5	—	8	13	
Univ. Wash.	5	1	—	6		
Univ. Va.	5	—	—	4	1	
Univ. Wisc.	7	1	—	2	5	1 (Airports)
Yale Bureau	—	—	42	—	42	
Total	185	31	67	110	159	14

TABLE 2. CODE FOR SUBJECT MATTER LISTINGS

Code *Subject Matter of Course*

a. Highway Planning, Economics, Finance, Adm.
b. Traffic Engineering
c. Geometric Design
d. Photogrammetry, Airphotos, Surveys
e. Pavement Design, Materials, Construction
f. Soil Mechanics
g. Rail, Waterway Engineering
h. Airport Engineering
i. Transportation Engineering
j. Other C.E. (Hydraulics, Structures)
k. Transportation (Economics, Geography, etc.)
l. Planning, Public Adm.
m. Mathematics, Statistics, Systems Analysis
n. Research Project
o. Other

*Report of ITE Committee on Traffic Engineering Education, "Traffic Engineering," April 1958

TABLE 3. TYPICAL COURSE SEQUENCES AT DIFFERENT UNIVERSITIES, AS REPORTED IN MAY, 1958

Brooklyn Polytechnic—A thesis is included in a typical M. S. sequence, along with the following courses (see code in Table 2): a, b, 2c, d, 2e, h, j, 2m.

University of California—Most graduate students work for a Master of Engineering degree. Four typical plans of study are as follows:

Area of Emphasis	*Courses*
Highway Engineering	2a, b, c, 2e, f, l, n
Traffic Engineering	2a, 4b, c, l, m, n
Gen. Transp. Engg.	a, b, c, e, 2g, h, i, l, n
Location & Const'n	2a, c, 2d, 4e, n

Cornell University—Major areas include (1) traffic, (2) airphotos, (3) highway materials, (4) highway soils, (5) highway design and construction, and (6) general transportation.

Georgia Tech.—Transportation graduate students take courses for the M.S. in Highway Administration, Job Planning, Traffic Surveys, Concrete Mix Design, and Asphalt Mix Design. Most also take course work in soil mechanics, structures or hydraulics.

Iowa State College—Courses suggested for the major in two typical sequences for the Master's degree are as follows:

Major	*Courses*
Highway Engineering	a, 2c, 4e, 2f
Transportation Engg.	a, b, 2c, h, i, 2k

Mass. Institute of Technology—Transportation and Surveying comprise one Division of the C.E. Department at M.I.T. Electives are often in City Planning, Soil Mechanics, Structures, Economics. Majors include courses selected from the following: a, b, c, d, e, 2h, i.

Michigan State University—A typical sequence for the major involves courses a, 2b, c, d.

Northwestern University—Students participate in a seminar with graduate students in other areas of transportation (economics, business, geography, etc.) City Planning, Statistics and Systems Analysis included for most Degree students. Typical programs of study for the M.S. include (some also include a thesis):

Area of Major	*Courses*
Highway Engineering	a, c, 2d, e, 2f, l, m, n
Traffic and Planning	a, 3b, c, e, 2k, l, 2m, n
Gen. Transportation	a, c, d, h, 2i, 3k, l, 2m, n

North Carolina State—Graduate courses include Transportation Analysis, Transportation Engineering Design, Transportation Planning, Adv. Transportation Engineering Design, Airports, Urban Planning and Mass Transportation, Municipal Engineering Projects. Mathematics or Statistics is the usual minor for the M.S.

Ohio State University—M.S. program generally includes thesis plus a major in materials or in traffic, planning and highway administration.

Purdue University—Students encouraged to take two courses (Highway Planning and Pavement Design) regardless of major interest. Two minors required with Statistics usually one of the minors. One minor in an allied C. E. area (Soils, Hydraulics, Structures, Geology), or in Mathematics or Economics. Course work also available in Railroad Engineering and Waterways, Ports and Harbors. Typical programs are as follows: (Some also include a thesis)

Area of Major	*Courses*
Highway Materials	a, d, 5e, 2f, 2 m
Traffic and Planning	a, 2b, c, d, e, k, 2m

Pennsylvania State—Programs are quite variable, or most work is on a project basis. Typical sequence: Highway Design (6 cr); Traffic Engineering (9 cr); General Studies (12 cr); Statistics (3 cr).

Texas A. & M.—Thesis research included in both of the following course sequences:

Area of Major	*Courses*
Highway	2c, 4e, f, n
Traffic	2b, 2c, e, 2m, n

University of Virginia—A "core" sequence of four courses includes (1) Soils and Aggregates, (2) Traffic Engineering, (3) Highway Soils Engineering, and (4) Highway Organization and Planning. A thesis and supporting work in structures, statistics, etc. are included. Electives include the following courses: a, c, d, 4e.

University of Wisconsin—Thesis is required, plus 24 credits selected from the following courses: a, b, c, d, 2e, f, h, j, k, l, m.

Content of Graduate Programs

There is a wide variation in the types of courses which are included in graduate programs of study. Even within the same university, there is considerable flexibility so that special programs of study can be arranged to fit the individual interests of each student.

Table 2 sets forth a subject matter code, which is used in Table 3 for indicating the typical course sequences which have been reported by the different universities. It is recognized that some of the course sequences which are presented in Table 3 are not necessarily complete, and that in addition there may be requirements for minors and for a thesis.

As shown in Table 3, the University of California has reported four typical sequences of graduate courses leading to a Master's degree, corresponding to four different areas of emphasis in graduate programs (highways, traffic engineering, general transportation engineering, and location and construction). It is possible, also, to vary considerably from these typical patterns in developing programs of study for individual students. However, each student generally will take courses in highway planning, highway design and highway finance, along with some coverage in areas outside of civil engineering. Each student also undertakes a research study or project as part of his program of study.

At Purdue University, graduate students working for the Master's degree generally specialize in either the highway materials area, or in traffic and planning. A major and two minors are required for the Master's degree. About two-thirds of the students major in highway materials, with the other third majoring in highway planning and traffic engineering. Most of the M.S. students followed a non-thesis option in 1958.

Highway materials majors usually select minors from the areas of statistics, soil mechanics and/or geology, with a few taking minors in mathematics or in highway planning and traffic engineering. Students majoring in highway planning and traffic engineering usually select minors in areas of statistics, transportation economics, or highway engineering.

At Iowa State College, (where I received my M.S. degree in Highway Engineering just 25 years ago), there are

two general areas of emphasis, one being highway engineering, and the other transportation engineering. Students majoring in transportation engineering generally deal primarily with traffic engineering, highway design, and principles of air and highway transportation, together with administration, economics and finance.

At North Carolina State, the term "transportation" is included in most of the course titles. However, all students are majoring in either highway or traffic engineering areas.

The graduate program in transportation engineering at Northwestern University is administered by the Civil Engineering Department, but is somewhat unique due to its close relationship with the Transportation Center at Northwestern University. The Transportation Center offers no academic courses itself, but provides financial support for faculty and for fellowships in each of several departments, including engineering, economics, business, geography, and sociology. The Center also serves as the coordinating agency for joint action in interdisciplinary approaches to the overall transportation problem, and for activity in research and in-service training.

Four interdisciplinary credit courses in transportation are offered for graduate students sponsored by the Transportatin Center. These four courses include transportation economics, systems analysis in transportation, the history of transportation, and a transportation seminar.

Graduate students in civil engineering usually take two or three of these interdisciplinary courses as a part of their program, along with work in statistics, city planning and individual research. Each student selects a major from one of the three areas of emphasis — highway engineering, traffic engineering or general transportation engineering. Typical sequences of courses for the three are shown in Table 3. During the past year, most of the graduate students in transportation engineering at Northwestern specialized in traffic engineering and urban transportation planning.

One interesting feature of the graduate programs in transportation at Northwestern is the course in systems analysis as applied to transportation problems. This course deals primarily with use of linear programming and related techniques in analyzing transportation systems. The students also take a course in mathematical statistics as a prerequisite for this systems analysis course.

During the past year, there were 25 graduate students enrolled in the interdisciplinary transportation seminar at Northwestern. This seminar was operated by a Transportation Center committee of faculty members representing the schools of business, engineering, geography, and sociology. The first part of the seminar consisted of lectures by faculty of the different departments on approaches to transportation problems in Metropolitan Chicago. For the remaining part of the seminar each student was assigned to an inter-disciplinary team which attacked a transportation problem in the Chicago area. One group, for example, analyzed the future of water transportation in the Chicago area, with the engineering member of the team reviewing and reporting on engineering reports which had been submitted on needed developments in ports and inland waterways.

During this next year, a non-credit transportation seminar will be given at Northwestern, with attendance required by all graduate transportation students. This will probably replace the other Seminar course which was described above.

Two graduate courses in general transportation engineering are to be offered for the first time this next year at Northwestern University. The first course is to deal with a comparative engineering analysis of each form of transportation, with particular reference to line haul. The second course is to deal primarily with terminals, distribution systems, and planning of integrated transportation systems.

An alternate plan would be to omit these two general courses in transportation engineering and to include instead a course in railroad engineering, and a course in waterways, ports or harbors. Comments will be appreciated.

Even with the stimulus provided by the Transportation Center, the demand for course work in general transportation engineering areas has so far been very limited at Northwestern University. With thorough coverage in courses dealing with highways, traffic engineering, urban transportation planning, airports, and air transportation, perhaps we are adequately taking care of the need for general transportation coverage by including courses in transportation economics, systems analysis and the transportation seminar.

General Comments

It is interesting to note that air transportation is coming in for increased attention at the University of California. Design of airport pavements has been included at many universities as part of the graduate program but coverage in related areas of airport planning and air transportation has not been a regular part of most graduate transportation engineering programs. The problem of air traffic control is another phase of air transportation that needs increasing attention.

Coverage in railroad engineering is not particularly in demand at the graduate level, although Professor Hay of the University of Illinois reported that several M.S. students majored in railroad engineering there a year ago. A few special students from foreign countries with a major interest in railroad engineering are currently enrolled at Purdue University. Undoubtedly work in this area can be given as project-type courses as the need arises. A new course in waterways, ports and harbors was first offered at Purdue University about two years ago, but has been given only on a project basis since that time, due to inadequate demand for the course.

One of the problems facing the graduate advisor is the extent of specialization which should be permitted in the individual programs of study. Should we allow a graduate student to major in highway materials, with a minor in soil mechanics, and another in geology, and thus obtain his Master's degree without ever being exposed to highway planning, traffic, or geometric design? Conversely, to what extent should we permit the student to major in traffic engineering, with no coverage in pavement design? I personally feel that specialization should be permitted, as long as there are some "broadening" courses included in each program of study.

One of the needs mentioned by several of those furnishing information, is the need for additional financial support for graduate students. Apparently, most of the graduate students are subsidized by fellowships, scholarships or assistantships. Obtaining ad-

(Continued on page 36)

Fortune Discusses—
The Nonsense About Safe Driving

The September issue of Fortune *magazine, a widely-read publication among business executives, contained an article entitled "The Nonsense about Safe Driving," written by John D. Williams, head of the Mathematics Division of the Rand Corporation.*

The article, as the title would indicate, complains about many of today's safety campaigns, and even suggests that the present death toll in traffic accidents is not too high. While many readers will not agree with the author's philosophy at this point, traffic engineers cannot help but go along with some of his specific complaints and suggestions.

With special permission of Fortune, *two significant sections of the article are quoted below.*

What's "Too Much" Speed?

The physical factor of greatest significance is unquestionably speed — precisely the item we have the strongest instinct to tamper with in the interest of reducing accidents. For consider that, while we move great loads of goods and people by road, the vehicle most characteristic is one that contains one person bent on a special personal mission. If speed were not the critical factor, this vehicle could be replaced completely and literally by a horse. The physical and social structure of the country would be almost frozen in its present attitude were we to freeze the speed of the automobile.

Speed is one of the really crucial factors in our society. As with any crucial factor, it is promising to look for more—in this case, more speed. I cannot help but believe that we would manage better if we were conscious of the need for more speed, rather than believing the exact contrary.

There is an almost involuntary impulse immediately to add, "But not too much speed." Now no one could advocate "too much" speed — that's bad by definition—but the question of when speed does become "too much" is a very thorny question. I encounter situations where, in my opinion, 10 mph is too much, and others where 80 mph is not too much, and the variations in the situations are too great to be controlled very intelligently by fiat and in advance. The speed at which vehicles have in fact operated from time to time has been determined principally by the drivers, who want very much to live, who have substantial personal investments in their hands, and who also know that any injury they do to other persons or property will entail very unpleasant consequences. Their intelligence, judgment, and skill are not always a match for the situations, but in general they have managed to exploit the equipment available without undue damage. They generally drive faster than those who seek to control speed think they should, but as the interested parties on the spot, their views are probably more nearly right than those of their critics. They are burdened by some feelings of guilt about the letter of the law, and they are subject to assault in the form of a fine or imprisonment if they are caught out of bounds. This business of making us into a lot of lawbreakers has been an unfortunate aspect of the development of the use of vehicles.

The situation may become intolerable as the technical devices of detection and control, such as radar, improve; intolerable in the sense that the utility of the vehicle may be lessened by strong enforcement of inappropriate, however well-intentioned, laws. Our laws tend to be aimed at the limitation of speed rather than at the promotion of traffic flow.

Seeing Red

Psychological factors also seem to play large roles in the use of automobiles. Consider the phemonenon of new communities. As our mobility has increased, we have built more cities. It would not be astonishing to discover, after the fact, that we average a new city when we average an increase of one mile per hour in speed. Consider this example: Suppose it is ten miles from a prospective homesite to work. It will require fifteen minutes of travel time if the traveler can average 40 mph, or twenty minutes if he can average but 30 mph. This is the kind of example that anti-speed advocates love. It is obvious that the five minutes saved at 40 mph isn't worth much, directly. If the man earns $5 an hour, it is apparently worth 42 cents, and he may expend rubber worth this much in one high-speed stop. The kinetic energy of the automobile increases as the square of the speed, so it is up by a factor of 16/9, an increase of almost 80 per cent, which may be a fair measure of the increased hazard. So why travel at 40 mph?

Such an analysis would miss an essential point: the driver is not motivated by those five minutes as minutes. In fact, he may not know within five minutes how long it takes. But the experience strongly affects important decisions. It may be that he has a feeling of well-being when moving rapidly and that he has one of intense irritation while sitting and staring at a red light. He may as a consequence decide not to live in that particular spot after all. If many others feel as he does, a community may not develop. So the five minutes, which means nothing to the individual driver and which is not very significant even when thousands of drivers are aggregated, may have a major effect on society. Thus there is an apparently irrational factor that tends to increase the importance of speed. Or one may look on speed as a catalyst that triggers other forces. It has undoubtedly been strongly instrumental in developing our urban civilization. Unfortunately it is so sensitive that the lawmaker who frames an unnecessarily inhibiting regulation, the local authority that installs in the hamlet two unnecessary, ill-timed traffic signals, or even the man who paints a white line on the highway in the wrong place, can inadvertently impose a loss on society.

Traffic News

Burton W. Marsh, (left), Director, Traffic Engineering and Safety Department, American Automobile Assn., Washington, D.C., presents D. Grant Mickle, Director, Traffic Engineering Division, Automotive Safety Foundation, with the Matson Memorial Award plaque, given annually by the Institute of Traffic Engineers to the nation's outstanding traffic engineer.
Seated are Matt Sielski (left), president of the ITE and Joseph Havenner, immediate past president. Mr. Sielski is Director, Safety & Traffic Engineering Department, Chicago Motor Club, Chicago, Illinois. Mr. Havenner, Director, Engineering & Technical Services, Automobile Club of Southern California, Los Angeles.

Mickle Named Matson Memorial Award Winner

D. Grant Mickle (Mem., ITE) was named 1958 winner of the Matson Memorial Award, in a ceremony the opening day of the Annual Meeting of the Institute of Traffic Engineers in Miami Beach.

Mickle, who is director of the Traffic Engineering Division of the Automotive Safety Foundation, was cited for his long career in the field, in Michigan, in Detroit, and for a number of years now with the ASF in Washington. He served as president of the Institute of Traffic Engineers from 1941 to 1943, and has been active in affairs of the Institute for many years.

The Award, established in memory of Theodore M. Matson, who at the time of his death was director of the Yale Bureau of Highway Traffic, is awarded annually to an outstanding traffic engineer. Winner last year was O. K. Normann, deputy assistant commissioner for research, U. S. Bureau of Public Roads.

Mr. Mickle presented a paper at the Miami meeting, which will be published soon.

Wohl Named Past Presidents' Award Winner for Paper on Aerial Photography

The 1958 Past Presidents' Award of the Institute of Traffic Engineers has been made to Martin Wohl (Jun. Mem., ITE), Instructor in Civil Engineering at Massachusetts Institute of Technology, for his paper, "Vehicle Speeds and Volumes Using Sonne Stereo Continuous Strip Photography."

Wohl, 28 years old, was presented with a certificate at the 28th Annual Meeting of the Institute being held in Miami Beach November 11-13. He also delivered a summary of his prize-winning paper at the opening technical session of the meeting.

Sharing the spotlight with Wohl were three other young members of the Institute of Traffic Engineers who were each voted an honorable mention for papers submitted in the same competition. They were: Edmund J. Cantilli, Highway Project Planner with the Port of New York Authority; John R. Crosby, Assistant Traffic Engineer of the New Jersey Turnpike; and Dennis L. Peterson, Engineer, Economist with the Oregon State Highway Department.

The competition is conducted annually by the Institute of Traffic Engineers to recognize the work of its younger members. Eligible are members under 35 years of age, who must submit a paper reporting an original work in the traffic engineering field. Last year the winner was a young engineer employed by the Port of New York Authority, Eugene J. Lessieu, who reported on a study he had made of acceleration ramps leading to expressways.

Judges of the competition were four former presidents of the Institute of Traffic Engineers. Chairman was J. Carl McMonagle, Assistant Director of the Michigan State University Highway Safety Center. Serving with him were: Burton W. Marsh, Director, Traffic Engineering and Safety Department, American Automobile Association; D. Grant Mickle, Director, Traffic Engineering Division, Automotive Safety Foundation; and Charles W. Prisk, Director, Highway Safety Study, U S. Bureau of Public Roads.

The winning paper will be published in the *Proceedings* of the meeting, and all papers will appear in TRAFFIC ENGINEERING magazine.

Sielski Elected President; Gravelle and Barton Win in Board Contests

Matthew C. Sielski was named President of the Institute of Traffic Engineers at the Annual Meeting held in Miami Beach November 11-13. Sielski, who is Director of Traffic Engineering and Safety for the Chicago Motor Club, has served as a member of the Institute's Board of Directors since 1953, and was vice president last year.

Elected as vice presidents were Edward G. Wetzel, assistant chief of the planning division of the Port of New York Authority, and Alger F. Malo, director of the Detroit Department of Streets and Traffic.

Named Secretary-Treasurer was Gordon K. Gravelle, assistant commissioner of the New York City Department of Traffic. This term, as with the other three officers, is for one year.

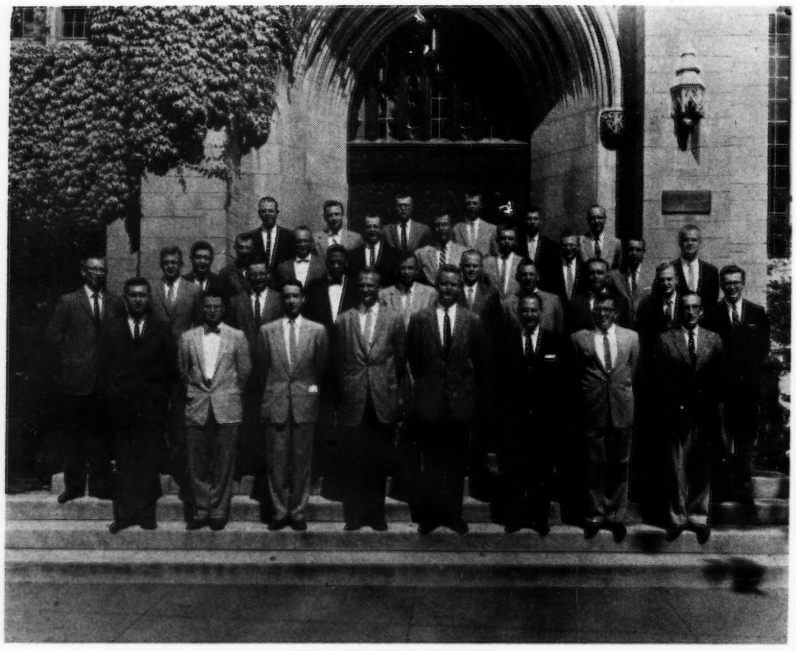
Three directors were chosen, each for a two-year term. In a close race in District 3, Eugene A. Barton, chief traffic engineer of H. K. Ferguson Co., Cleveland, won over two opponents. He finished in a tie with Sam Cass, traffic engineer of Metropolitan To-

Presidents compare notes. Left to right, Matthew Sielski, Director, Safety & Traffic Engineering Department, Chicago Motor Club, Chicago, Illinois, president of the Institute of Traffic Engineers, and Joseph Havenner, Director, Engineering and Technical Services, Automobile Club of Southern California, Los Angeles, immediate past president of the Institute.

ronto, in the mail vote, and the issue was finally decided in the Board of Direction.

In District 5, M. V. Greer, traffic engineer of the Texas Highway Department was elected director; and in District 6, J. Al Head, assistant traffic engineer of the Oregon Highway Department, was elected.

Remaining on the Board for another year are: Fred W. Hurd, District 1; Michael J. Gittens, District 2; William R. Marston, District 4; J. E. Havenner, Immediate Past President.



YALE STUDENT CHAPTER

Bottom Row—Ferreri, McEvoy, Argue, Vechesloff, Bonniville, Bonelli, Rice, Albert.
Row 2—Van Gelder, Noblitt, Dane, Rockafellow, Downes, Christ, Nicolaysen, Lichtman, F. Hicks, Palmer, Heany.
Row 3—Pline, Riddle, Gonseth, Echols, Hesketh, Haenel, Kaiser, McDonnell.
Top Row—T. Hicks, Ciletti, Orne, Love, Shiatte, Bennett

Student Chapter Organized at Yale Bureau

The thirty-two members of the 1958-59 class at the Yale Bureau of Highway Traffic have organized the Yale Student Chapter of the Institute of Traffic Engineers.

Elected President for the first semester is Melville R. Palmer. Vice President of the group is Michael G. Ferreri, and the Secretary-Treasurer is Russell Albert.

Two of the members of the class are Junior members of the Institute, Alan T. Gonseth and John M. Kaiser.

The full roster of the student chapter is as follows:

Albert, Russell, Assistant Traffic Engineer, Washington State Highway Department, Spokane.

Argue, Alan E., Division Engineer, Canadian National Railways, Toronto.

Bennett, Richard C., Traffic Analyst, Department of Highways, Washington, D. C.

Bonelli, Edward R., New York City Department of Traffic.

Bonniville, John W., Highway Engineer Trainee, Virginia Department of Highways, Richmond.

Christ, John E., Assistant Engineer Highway Trainee, New Jersey State Highway Department, Trenton.

Ciletti, Vincent, Area Engineer, Columbus, Ohio.

Dane, William M., Assistant Engineer, Oklahoma Highway Department, Oklahoma City.

Downes, Donald P., Assistant Engineer, Edwards and Kelcey, Newark.

Echols, James C., Highway Engineer Trainee, Virginia Department of Highways, Richmond.

Ferreri, Michael G., Simpson and Curtin, Philadelphia.

Gonseth, Alan T., Planning Technician, Port of New York Authority, New York.

Haenel, Herman E., Resident Designer, Texas Highway Department, Houston.

Heany, J. J., Assistant Traffic Coordinating Engineer, Bureau of Traffic Engineering, Philadelphia.

Hesketh, Frederick A., Highway Engineer Intern, Connecticut State Highway Department, Hartford.

Hicks, Frank L., Deputy City Engineer, Melbourne, Australia.

Kaiser, John M., Assistant Civil Engineer, New York Department of Traffic, New York City.

Lichtman, Albert P., Senior Engineer, City Engineer's Department, Cape Town, South Africa.

Love, Gerald D., Highway Design Engineer, U.S. Bureau of Public Roads, Albany.

McDonnell, James J., Designer Estimator, U.S. Steel Corporation, New York.

McEvoy, Robert W., Highway Designer, Abbott Engineering, Inc., Boston.

Nicolaysen, Paul, Engineer Grade II, Provincial Roads Engineer, Cape Town, South Africa.

Noblitt, Jack L., Traffic Engineer I, Wyoming Highway Dept., Cheyenne.

Orne, Donald E., Assistant District Traffic Engineer, Michigan State Highway Department, Jackson.

Palmer, Melville R., Assistant Traffic Engineer, Transport Department, Wellington, New Zealand.

Pline, James L., Traffic Technician, Idaho Department of Highways, Boise.

Rice, Sheldon, Brown & Blauvelt, Consulting Engineers, Woodbury, N. J.

Riddle, Ralph M., Traffic Engineer I, City-Parish, Baton Rouge, Louisiana.

Rockafellow, Richard M., Engineer Trainee I, Michigan State Highway Department, Lansing.

Shiatte, Kenneth W., Assistant Highway Engineer, California Division of Highways, Marysville.

van Gelder, William G., Junior Traffic Engineer, Seattle Traffic Division, Seattle.

Vechesloff, Igor, Civil Engineer, Lomis & Sullivan, Hartford, Conn.

"Urban Roads and Streets" panel at the recent Copenhagen conference. L to R: Dr. R. J. Smeed, Road Research Laboratory, Great Britain; Mr. David K. Witheford, Planning Engineer, State Highway Department, Delaware; Mr. Gunnar Kullstrom, Traffic Engineer, Stockholm, Sweden; Mr. J. F. A. Baker (Chairman of the Panel), Chief Engineer (Highways), Great Britain; Prof. R. Coquand, France, and Prof. Dr. M.-E. Feuchtinger, Consultant Traffic Engineer, Germany.

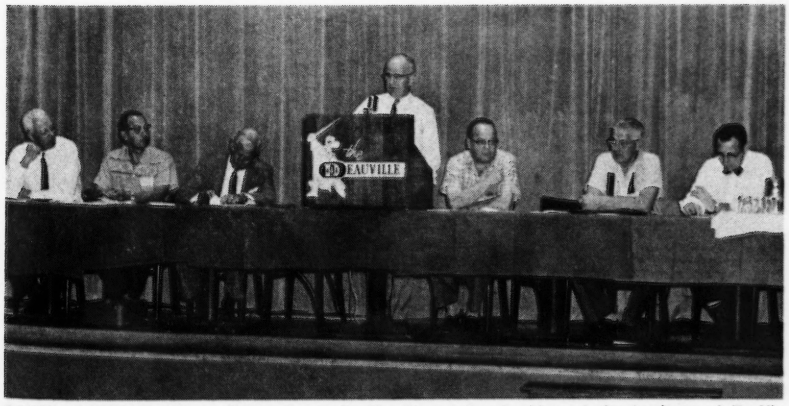
Yale Bureau Alumni Attend Copenhagen Meeting

The International Study Week in Traffic Engineering recently held in Copenhagen had among its 600 delegates a good representation of graduates of the Yale Bureau of Highway Traffic.

The exact number is not known, but was in the neighborhood of 25 of the Yale Alumni, only two of whom came from the U. S. A. As an example of participation the activities of the Class of 1955 can be cited. The following six men from the class attended: Siegfried Giesa (Germany), G. E. Kastrup (Denmark), G. Kullstrom (Sweden), K. Leinonen (Finland), M. C. Rotach (Switzerland), and D. K. Witheford (USA). Several of these men participated in the meeting.

Kastrup, known to class-members at Yale under the name of Jensen, prepared a paper describing an effective scramble system installation in the City of Odense. Kullstrom had a paper on parking meters and was also a panel member on the Urban Streets session. Rotach's paper described the characteristics of motorcycle operation on rural European roads. Witheford was a panel member also during the session on Urban Streets.

This would seem to indicate something about the effect of the course up at New Haven, but we'll let you draw your own conclusions, or else call on Fred Hurd for comments.



PANEL ADDRESSES ITE — Electronics in Traffic Control Panel addressed the Institute of Traffic Engineers at its 28th annual meeting at the Deauville Hotel in Miami Beach. Panel members are (l. to r.) O. K. Normann, Assistant Deputy Commissioner, U. S. Bureau of Public Roads; Alger Malo, Director of Traffic and Streets, Detroit, Mich.; Stenographer; L. E. Flory, RCA Laboratories (at podium); T. T. Wiley, Commissioner of Traffic, New York City; Herbert Higgins, Washington Highway Department; and Joseph Bidwell, General Motors Research Staff, Detroit.

Federal Reimbursement For Roads Incorporated Into Interstate System Still Under Study

Recent reports in the public press and elsewhere have created the erroneous impression among many highway users that a resolution passed by the recent Congress specifically provides for Federal reimbursement to the states for toll or toll-free roads which are incorporated into the Interstate System.

House Joint Resolution 654, now Public Law 85-845, requests the Secretary of Commerce to submit within 10 days of the opening session of the next Congress "recommendations for legislation for the purpose of assisting Congress to determine whether or not to reimburse each State for any portion of a toll or free highway" which (1) is incorporated into the Interstate System, (2) meets Interstate standards, and (3) has been completed since August 2, 1947, or is under construction by contract awarded not later than June 30, 1957.

The House Public Works Committee's report on the resolution stated

specifically that it was recognized that it is the responsibility of the Congress to determine whether or not reimbursement should be made. It was further stated that the resolution only requires the Secretary of Commerce to submit possible methods of making reimbursement without making any recommendations as to whether or not reimbursement should be made.

Thus, contrary to some published reports, the Commerce Department's assignment is merely intended to help guide the Congress in determining whether or not it should take action to reject or approve such reimbursement.

Conclusions Reported by Engineers and Planners At Sagamore Conference

The more than 50 highway officials, city administrators, planners, housing officials and civic leaders who met early in October under the auspices of the National Research Council, American Municipal Association, American Association of State Highway Officials and Syracuse University have issued a statement of "Findings and Recommendations." The report was made public by A. E. Johnson, Executive Secretary of AASHO and general chairman of the Sagamore Conference. A detailed report of conference findings will be published within a couple of months.

"The urgent need in this field," Mr. Johnson said, "is for a greater working relationship between state highway and local planning officials to ensure that new highways provide the maximum benefit to each community of the nation.

"Through the Conference a clearer understanding has been achieved of the complex relationships between urban development and the new highways of all types required to serve metropolitan areas. The general agreement on individual and joint responsibilities of state and local officials in this field is a major accomplishment, and is most encouraging." The preliminary reports issued by Mr. Johnson follows.

FINDINGS AND RECOMMENDATIONS

Findings

1. In order to meet the urgent needs for highway improvement involving the planning, designing and operation of these facilities, so as to provide the optimum transportation service, and to accomplish the orderly and proper development of our urban communities, it is essential that all units of government cooperate.

2. It is recognized that the fine relationship between the Federal Bureau of Public Roads and the State Highway Departments has done much in implementing the highway program in the state and local communities.

3. Each State Highway Department has the prime legal responsibility for implementing the state highway programs, including the National System of Interstate and Defense Highways, and its completion within the prescribed time.

Recommendations—State

1. The State Highway Departments should be organized and properly staffed to work cooperatively and effectively with local authorities in planning, designing and construction and operation of streets, highways and expressways in urban areas.

2. The State Highway Departments, in cooperation with the local governments, should develop a tentative program of highway improvements, including the urban areas, for a period of at least five years in advance as a basis for planning at the local level. This program should be in accordance with a jointly agreed upon long range plan.

3. The State Highway Departments should consult with the local authorities on a continuing basis in highway planning.

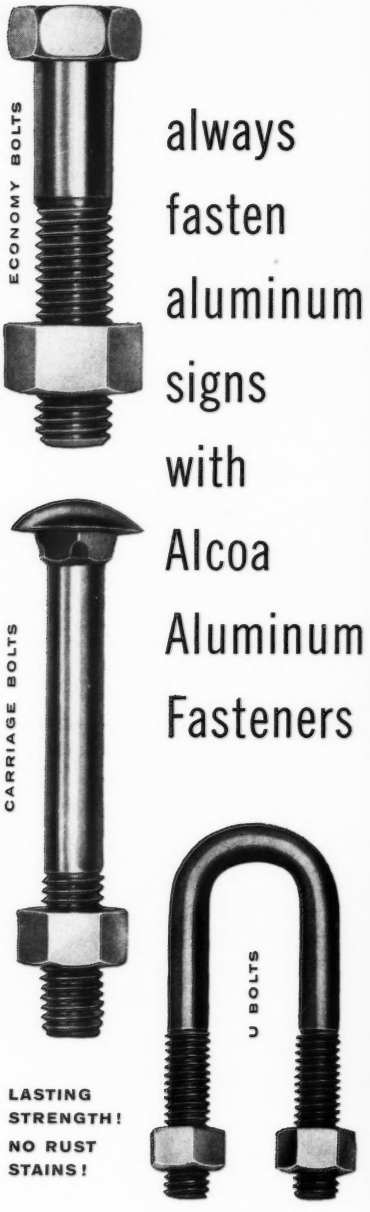
4. In the event that community planning is not achieved by local government, the State should take the responsibility for initiating planning.

Recommendations—Local

1. The local governments should fulfill their primary responsibility for community planning needed to insure the maximum benefits to the local area from the highway program.

2. The local governments in fulfilling their responsibility should take the initiative for the preparation of a comprehensive plan for the physical development of the community. This should include a land use plan, a transportation plan including public transit, and a program of land use controls. To achieve the above objective, urban areas should have continuing competent planning service.

3. Regional planning should be initiated in every metropolitan area.



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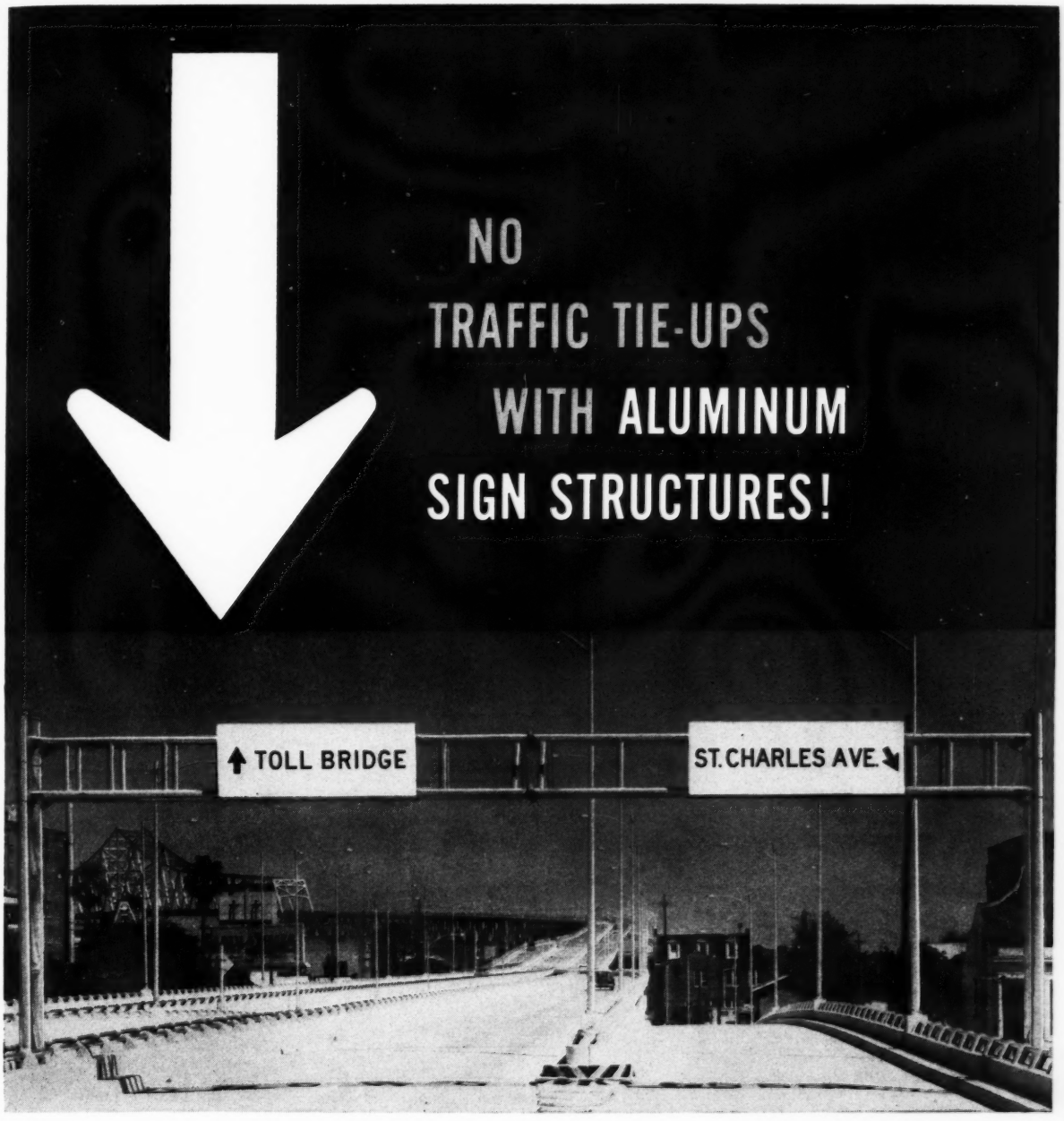

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4. Local governments should consult on a continuing basis with the State Highway Department in the preparation of comprehensive plans for urban areas.

5. If legislation is lacking to enable proper planning on a local, metropolitan or regional basis, the state and local governments should join to have such legislation enacted.

Recommendations—Joint

1. All levels of government should strengthen their support of city and regional planning. All federal agencies dealing with urban development should continuously review their policies to achieve coordination with state and local objectives in urban development and transportation.

2. Public support and adequate finances are essential for the implementation of the desirable programs based upon comprehensive planning. All agencies of government should seek this support through the presentation of all facts relating to the plans.

3. To provide the basis for transportation and broad community planning all agencies concerned should promptly undertake studies and surveys to develop the necessary basic facts, using the appropriate techniques. In the area of transportation planning the Guide and Manuals of the National Committee on Urban Transportation offer excellent procedures for the assembly and analysis of needed data.

4. Steps should be taken to disseminate examples of successful application of techniques and achievement in coordinated urban development. This should be accomplished through the American Municipal Association — American Association of State Highway Officials Joint Committee on Highways and other interested organizations.

University Research Scientist Runs Night Visibility Tests

How much light is needed on highways at night to see obstacles in time to stop a vehicle safely from a speed of 30 miles an hour? Forty miles an hour? Fifty miles an hour?

Lighting engineers don't accurately know. But they began a series of historic tests recently in Columbus, Ohio in an effort to find out with the help of Ohio State University scientists.

Playing key roles in the tests were life-sized, three-dimensional figures of a child — the average size of an 11-year-old — and her black terrier. The models were observed under existing street lighting at intervals of 100 feet by a team of light and vision experts using a new visibility-measuring instrument placed in the position of an on-coming car.

Police Close Off Highway

City police blocked off the busy traffic artery for more than two hours, diverting traffic to parallel streets until after 2 a.m., so that the tests could be run without interruption.

The midnight tests were the first outdoor lighting experiments ever made with the new measuring device which illumination experts believe is the most accurate and sensitive of its kind ever developed.

Additional post-midnight tests will be run in the same area shortly, with the same models—and possibly others —placed at various positions between street lights. Similar experiments are being planned for several other Ohio cities.

The tests will show the minimum amount of light required on highways for drivers to recognize obstacles at various distances. Data will be calibrated in terms of the length of time it would take drivers, moving at various rates of speed, to stop their vehicles after recognizing an obstacle. The observers expect to have initial answers in approximately 60 days.

Ohio State University Professor Runs Tests

Tests were conducted by Dr. Richard Blackwell, newly-appointed director of the Ohio State University's Institute for Research in Vision, assisted by members of his staff.

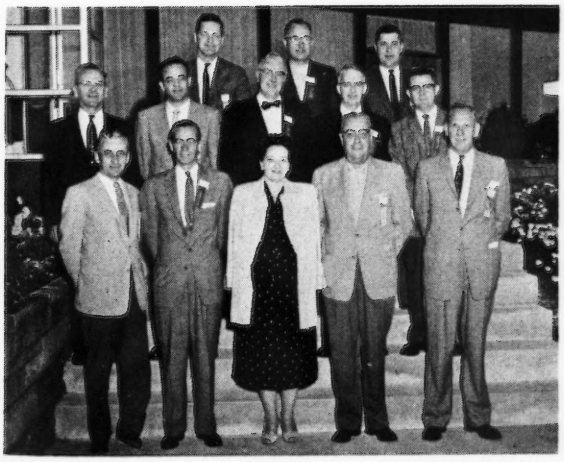
The initial tests, which are being sponsored by the Illuminating Engineering Research Institute, were planned in connection with some of the nation's leading street-lighting authorities.

A number of the society's recommendations are incorporated in American Standards Association publications which tens of thousands of the country's engineers, architects and designers depend upon for tested and approved data on road and building construction. Thus, the results of the Columbus street-lighting tests may be-

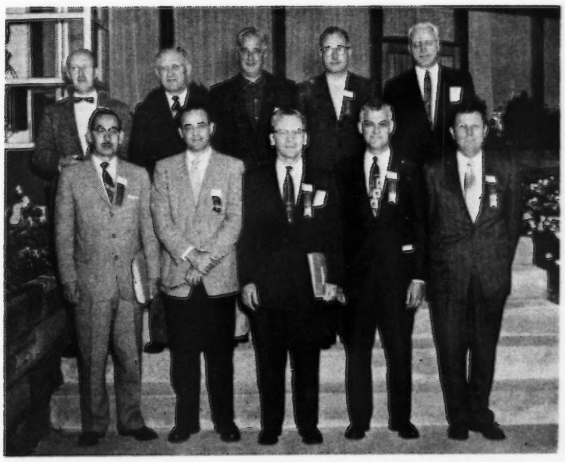
(Continued on page 40)

FREEWAY SEMINAR PHOTOS

The Harrisburg Seminar group poses for its picture on the lawn of Holiday Motel.



The committee responsible for planning and arrangements at Harrisburg.



The speakers group at Harrisburg. L to R: Ricker, Malo, Hanna, Robinson, Lowe, Wetzel, Gittens, Loutzenheiser, Normann, and Polkinghorn.

New Appointments

Fratar Elected Director of ASCE

Thomas J. Fratar, (Member, ITE), was elected Director for District 1 of the American Society of Civil Engineers and installed in his new office during the annual convention held in New York City during October.

Thomas J. Fratar

Fratar joined the firm of Tippetts-Abbett-McCarthy-Stratton in 1946 following World War II military service in the Persian Gulf Command. He has been a full partner since 1956.

In his association with the firm, Mr. Fratar has been responsible for numerous comprehensive traffic, transportation and economic studies for highway, bridge and tunnel projects, port development plans and multi-purpose river development schemes. In the course of directing many highway planning and traffic surveys, he developed his successive approximation procedure for estimating the intrazonal movements of traffic. This method has been approved in plan by the United States Bureau of Public Roads and has been widely used subsequently in the course of numerous urban area traffic surveys.

Fratar is co-author of the traffic engineering section of the civil engineering handbook "American Civil Engineering Practice," published by John Wiley & Sons and, in addition, author of many papers dealing with highway planning, and traffic and highway engineering.

Fratar is a graduate of Rensselaer Polytechnic Institute, 1936, with a degree of Civil Engineer and of Yale University, 1942, with a degree of Master of Engineering.

He is now Chairman of the New York Annual Convention Committee of the American Society of Civil Engineers and has served on many ASCE committees. He was made an honorary member of Chi Epsilon in 1956, and has been a member of the Institute of Traffic Engineers since 1948. Other professional societies in which he is active include: The American Institute of Consulting Engineers, the New York State Society of Professional Engineers, the Highway Research Board, and Sigma Ki. He is also a member of the Engineers' Club and Yale Club of New York.

Mr. Fratar is a registered professional engineer in seventeen states, the District of Columbia and Puerto Rico.

Henberger Establishes New Business in San Diego

John C. Henberger (Associate Member, ITE) has established the John C. Henberger Company in San Diego. He will become manufacturer's representative for a number of highway and traffic engineering firms, devoting his attention to southern California and Arizona.

Henberger had been with A'G'A for the past five years, most recently as Western District Sales Manager. Earlier he had been an assistant traffic engineer in the City of San Diego. A graduate of the University of Illinois, he is well acquainted in the Institute of Traffic Engineers and has been an active member of the Western Section.

Coming Events

1959

January 5-9—HIGHWAY RESEARCH BOARD — Sheraton Park Hotle, Washington, D. C. Contact: HRB, 2101 Constitution Ave., Washington 25, D. C.

January 28 - 30 — CALIFORNIA STREET AND HIGHWAY CONFERENCE — 11th Annual Conference, Berkeley. Contact: Institute of Transportation and Traffic Engineering, University of California, Berkeley, California.

March 1 - 3—SOUTHERN SAFETY CONFERENCE Battery Park & George Vanderbilt Hotels, Asheville, N. C. Contact: W. L. Groth, Exec. Dir., P.O. Box 8927, Richmond 25, Va.

March 23-25 — WESTERN SAFETY CONGRESS — Ambassador Hotel, Los Angeles, California. Contact: Joseph M. Kaplan, Greater LA Safety Council, 3388 W. 8th St., LA 5, Calif.

May 10 - 14—AMERICAN SOCIETY OF PLANNING OFFICIALS— Annual Conference, Hotel Leamington, Minneapolis, Minn. Contact: ASPO, 1313 East 60th Street, Chicago 37, Ill.

New Publications

Vehicle Placement Study 1955.

Technical Report #58-5. Oregon State Highway Department, Salem, Oregon. 1958. 160 pp.

This report presents data on speed and placement of vehicles at six selected locations on 2-lane highways in Oregon. The data were accumulated in an effort to determine what effect shoulder treatment had upon the position of the vehicle with respect to the centerline and the shoulder. The data in this report were combined with data obtained at study locations in 8 other western states and were reported by Asriel Taragin of the U. S. Bureau of Public Roads in a paper presented at the January 1957 meeting of the Highway Research Board. The paper, entitled "Driver Behavior Related to Types and Widths of Shoulders on Two-Lane Highways," was printed in *Public Roads* in August 1957.

A summary of the findings of the Oregon portion of the study and conclusions reached by the Department are also contained in the report. The principal conclusion was that the construction of lanes and shoulders of contrasting colored aggregates is an effective method for reducing travel on the paved shoulder. A painted shoulder stripe was also found to be very effective. Signs appeared to have no appreciable effect on deterring travel on the shoulder.

Other interesting conclusions were that the percentage of vehicles encroaching on the left lane appeared to be unrelated to the visual traffic lane width. There also appeared to be no relationship between vehicle speed and the visual traffic lane width.

Parking Practices on College Campuses In the United States.

By L. H. Csanyi. Bulletin 181 of the Iowa Engineering Experiment Station, Iowa State College, Ames, Iowa. 1958. 20 pp. $0.50.

This bulletin reports a questionnaire survey made of parking practices on college campuses. Responses were received from 125 colleges and universities, of which 115 are evaluated in the report.

The report concludes that parking problems on many campuses are approaching serious proportions. Need

for competent traffic analysis was reported as appearing desirable on most campuses. No trends in ways of handling the various parking situations were apparent, with each institution imposing such controls as appear best in its own particular situation. The experience and methods of control used by the reporting schools do, however, offer an interesting cross section for those interested in the subject.

Courses In Highway Safety and Highway Traffic.

National Commission on Safety Education and Office of Education, U. S. Department of Health, Education and Welfare. Distributed by National Education Association, 1201 16th Street N.W., Washington, D.C. 1958. 100 pp. $1.00.

A comprehensive directory of college courses in highway safety and transportation now is available to public officials and others interested in traffic training.

The booklet sets forth the results of a pioneering survey of almost 2,000 colleges and universities in the United States. The study was conducted by the U. S. Office of Education and the National Education Association, under a grant from the Automotive Safety Foundation.

Listed in the directory is detailed information about the 975 training courses available in 328 colleges and universities in 1956-57 and 1957-58.

The courses are arranged under five headings: Education (traffic safety and driver education); Engineering (traffic and highway engineering, planning and administration); Enforcement (police traffic supervision, laws and courts); Motor Vehicle Fleet Operation, and Specialized Offerings (accident investigation, driver and accident records, driver licensing, intoxication testing, and school transportation).

The document also provides brief descriptions of the work of 22 national organizations which cooperate with higher educational institutions in developing training courses.

Electronic Controls and Traffic Safety.

The Safety Education Project, Teachers College, Columbia University, New York 27, N. Y. 1958. 96 pp. Quantity prices on request.

The publication contains background papers prepared for use of the participants and the final report of the Conference on Electronic Controls and

SIGNS OF PROGRESS

By

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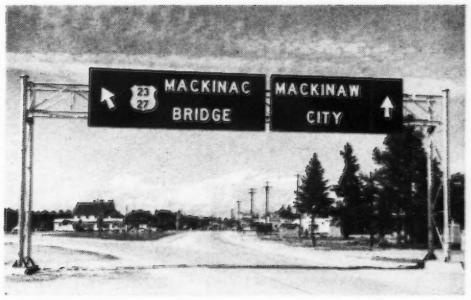

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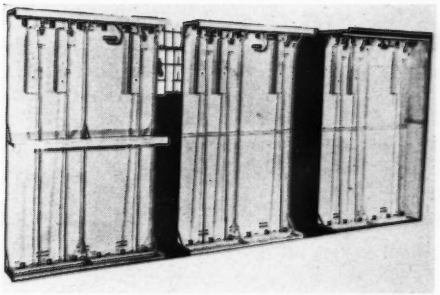

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Traffic Safety, held at Arden House, Harriman, New York, on May 14-16, 1958.

Included are papers by V. W. Zworykin and L. E. Flory of RCA Laboratories, Joseph B. Bidwell of General Motors Research Staff, Winston E. Kock of Bendix Aviation, T. T. Wiley, New York City Commissioner of Traffic, Eugene Maier, Director of Houston's Department of Traffic and Transportation, E. R. Ricker and J. R. Crosby of the New Jersey Turnpike, J. E. P. Darrell of the Minnesota Highway Department, and Alfred L. Schwartz of Columbia University. Also included are addresses by Congressman Kenneth A. Roberts and Burton W. Marsh of the American Automobile Association.

GRADUATE PROGRAMS

(Continued from page 25)

ditional graduate students thus will depend on getting additional funds for fellowships or research assistance.

Another major need in graduate work in the transportation area is the need for more students who go on for the Doctor's degree. With the increasing trend toward requiring Doctor's degrees as a prerequisite for advancement on the faculties of civil engineering schools, it becomes apparent that one of the major shortages at the present time is that of professors with the doctorate who can staff courses in the different universities. It is gratifying to note that there are nine doctoral candidates at Purdue University, and five at the University of California, majoring in transportation engineering. We expect to have several such candidates at Northwestern next year.

Conclusion

The results of this analysis indicate that most of the graduate work in transportation engineering is today directed primarily toward highways — materials, design, planning and traffic areas—with secondary attention to air transportation.

In planning for the future we should not overlook other forms of transportation, but should give our students a broad picture of the importance of all forms. We should also direct some of our research toward air transportation and toward integrated transportation systems. Then as the demand develops for engineers with graduate training in specific areas of transportation engineering, we can be ready to meet that need.

Strictly Business

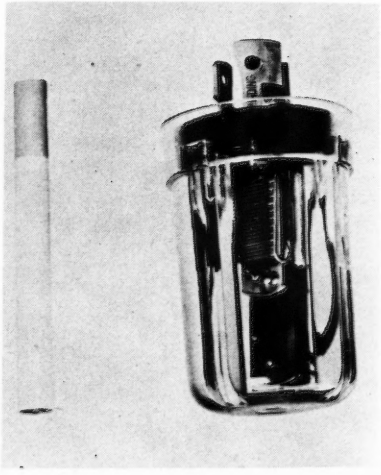
Photo-Electric Control Reduces Outdoor Lighting Maintenance

A photo-electric control designed to eliminate sources of failure in more complicated units has been made available by Precision Magnetic Controls of Ridgewood, New Jersey.

The compact unit, which is not much longer than a cigarette, features two-precision-engineered components — a single-throw integrating relay and a light-sensitive photo cell. The photo-electric cell de-energizes and energizes the integrating switch to close and open circuits at pre-determined natural light levels. According to the manufacturer, the control's compact design, rugged construction and simplicity reduce the initial cost, and virtually eliminate maintenance.

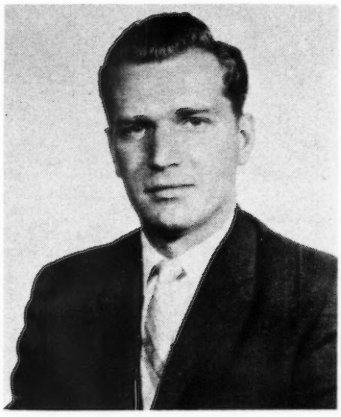
The unit is reated at 105-130 volts, 25/60 cycles. The maximum direct lamp load is 1800 watts. Operating levels can be set within 1 to 6 ft-candle range. A time delay avoids activation from momentary light sources. Daytime power dissipation is 2.8 watts, and night time power consumption is negligible (approximately .005 watt).

Installation is easy, the manufacturer reports, with a polarized prong arrangement which assures positive position. Mountings are available for use at the top of a pole, on a cross arm or bracket, on the luminaire, or in other locations. The unit is guaranteed for two years by the manufacturer, Precision Magnetic Controls, Inc., 34 Cottage Place, Ridgewood, New Jersey.



Tiedge Named Sales Representative For Veon Chemical

The appointment of Fred R. Tiedge to the position of sales representative for Veon Chemical Corporation, 22-09 Bridge Plaza North, Long Island City, N. Y., has been announced by Dwight T. Myers, president of the organization which manufactures Perma-Line traffic control marking compound.



Fred R. Tiedge

Mr. Tiedge, thoroughly experienced in modern traffic control methods, is a graduate of the Illinois Institute of Technology. He is a former sales engineer for EL-TEC, a subisdiary of Standard Coil Products Co., Inc., Chicago.

In his new post with Veon, Mr. Tiedge will deal primarily with the plastic thermo-compound used throughout the country for crosswalk and street markings.

Smith Appointed Head of GE Outdoor Lighting Department

J. Stanford Smith, of New Canaan, Conn., has been named General Manager of the General Electric Company's Outdoor Lighting Department in Hendersonville, N. C.

Mr. Smith, who has been Manager of Public and Employee Relations Communications for the Company, with headquarters in New York City, has been engaged in a wide variety of positions in the fields of accounting, marketing, and public and employee relations.

A native of Terre Haute, Ind., he began his career in General Electric in 1936, shortly after graduation from DePauw University. After service in the Accounting Department and a number of different components in the Apparatus Advertising and Sales Promotion Department, Mr. Smith became Manager of the latter Department in Schenectady, New York, in 1947, with responsibility for promoting the sale of more than 2000 products for the generation, distribution, and utilization of electric power. He was also a member of the Company's Apparatus Sales Committee.

In December 1953, Mr. Smith was appointed Manager of General Public Relations and moved to the Company's headquarters. He was appointed to his most recent position in July, 1956 when the Company merged its Public and Employee Relations Services.

His work on the Scotia-Glenville, New York, Board of Education attracted national interest and he has been a featured speaker before the National Education Association. He has been an industry representative on the Regents Advisory Council of the State of New York which prepared an exhaustive study of the type of secondary education program needed for the future.

He is a member of the American Management Association, Phi Gamma Delta and Phi Beta Kappa.

R. J. Swackhamer Retires From General Electric After 36 Years

R. J. Swackhamer of Hendersonville, N. C., has retired after more than 36 years of service with the General Electric Company.

He was manager of User Industries Sales for the company's Outdoor Lighting Department at the time of his retirement.

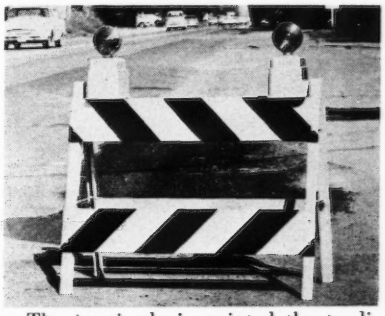
Following graduation from Syracuse University with a degree in electrical engineering, he joined General Electric in 1922 on the Test Engineering program. He later became a floodlighting application engineer in the former Illuminating Engineering Laboratory.

After serving for a period as manager of floodlighting and traffic sales, Mr. Swackhamer was named, in 1950, as manager of street lighting sales. In 1952 he became sales manager for the former Lighting and Rectifier Department. He held this position until 1954 when he moved into his final General Electric assignment.

Mr. Swackhamer is a member of the Illuminating Engineering Society, a former Affiliate of the Institute of Traffic Engineers, and a member of the International Municipal Signal Association.

Pacific Mercury Offers New Folding Barricade Kit

Pacific Mercury is introducing a new folding barricade for use on highway and construction projects or industrial maintenance jobs.



The barricade is painted the traditional yellow and black and meets state highway safety specifications. In addition, it is so designed that it is non-collapsible — even when subjected to wind pressure from large trucks.

Sturdily constructed for long durability under severe weather conditions, the barricade has steel legs, marine plywood cross bars, and the flasher light bolts on so that it is tamperproof and theft-proof, according to the manufacturer.

The flasher light included with the folding barricade kit is the new Pacific Mercury model with visibility extended 103 per cent in both neon and transistorized models. The light is available with a standard 4¼-inch head, seven-inch head, or 360° dome-type head. A parabolic reflector can be substituted for one of the seven-inch lenses if desired.

All lights are engineered to meet operating reliability standards of Air Force Bomber guidance systems; electronic mechanisms are transistorized with exclusive Pacific Mercury circuitry and will operate in any extremes of temperature, it is claimed.

The Pacific Mercury barricade kit is in production now and available on immediate delivery through the company's sales headquarters at 14052 Burbank Boulevard, Van Nuys, California.

Positions Available

ORLANDO, FLORIDA

Position: Survey Technician, to plan, supervise, and participate in major technical traffic engineering studies and projects in the traffic engineering department.
Requirements: Knowledge of traffic volume counts, parking surveys, speed studies, physical layouts, accident analysis, drafting and investigation of complaints.
Salary: $325 to $350 a month to start, depending upon qualifications. Merit system tenure.
Apply: City Personnel Department, Room 503, City Hall, Orlando, Florida. State full qualifications and work experience in first letter. Photo or snapshot preferred.

NEW JERSEY BUREAU OF TRAFFIC SAFETY

Position: Senior Traffic Engineer.
Requirements: B.S. in engineering, plus one year's specialized training in traffic engineering or equivalent experience. Duties include all phases of traffic engineering with emphasis on traffic operations, and involve contact with county and municipal officials.
Salary: $5774 to $7508.

Position: Principal Traffic Engineer.
Requirements: In addition to the above requirements for Senior Traffic Engineer, at least 5 year's additional experience in traffic engineering is required. Registration as a P.E. would be desirable. Duties would be of a more complex nature and would involve larger areas of supervision and in general more responsibility.
Salary: $6684 to $8688.

Apply: H. J. Klar, Chief Traffic Engineer, N. J. Bureau of Traffic Safety, 32 E. Hanover St., Trenton, N. J.

HOUSTON, TEXAS

Position: Senior Traffic Engineer.
Requirements: Graduate Engineer with course or experience in traffic Engineering field.
Salary Range: $400 - $700 per month. Starting Salary $550 per month.

Position: Junior Traffic Engineer.
Requirements: Graduate Engineer or minimum of two years engineering study with three years experience in traffic engineering field.
Salary Range—$350 - $600 per month. Starting salary $450 per month.

Apply: Eugene Maier, Director, Department of Traffic & Transportation, 702 City Hall, Houston 2, Texas.

KANSAS CITY, MISSOURI

Position: City Traffic Engineer, to organize and head operations section in Traffic Department. Responsible only to Director of Department.
Requirements: Prefer college graduate in civil or traffic engineering with at least five years traffic engineering experience, part of which should have been in responsible charge.
Salary: $585 - $710 per month with recommendation now pending for range increase.

Position: Associate Traffic Engineer, (2), to plan, supervise and participate in major technical traffic engineering studies
(Continued on page 54)

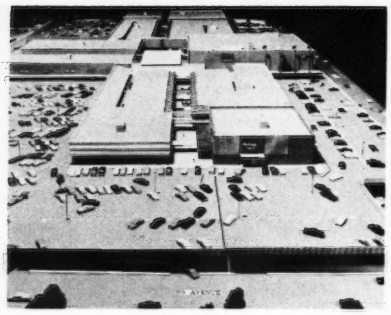


Figure 6
Looking east along pedestrian mall. Roof truck concourses are partially covered in loading areas and terminate in a turntable. The right foreground access is an underground truck concourse exit, the left access is to the intermediate parking level.

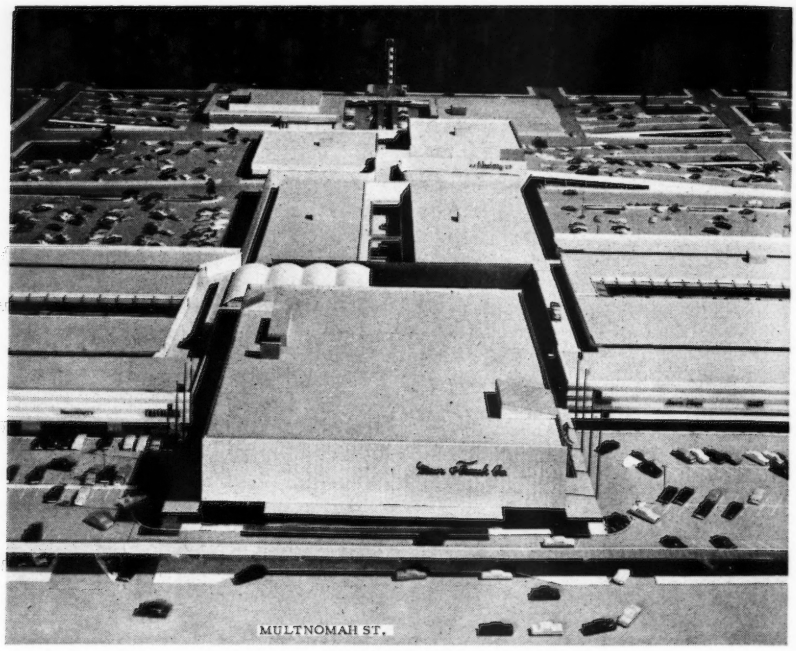


Figure 7
Lloyd Center model looking north from Multnomah St. showing the principal tenant, Meier & Frank, with 300,000 square feet on five levels (design will accommodate additional floors for expansion). The underground truck concourse entrance is the wider access left of the Meier & Frank Building. This concourse serves Meier & Frank and the Multnomah and intermediate level shops to the west (left). The roof top truck concourses are partially covered in the actual loading areas. The inclined parking area (at Newberry Co.) serves a dual role as ramp to these service concourses.

LLOYD CENTER

(Continued from page 13)

2. The centralizing influence of a center in this location is better for the city's development than would be the tendency toward decentralization, characteristic of regional shopping centers now being located near the edges of other cities in the country.

3. The city as a whole will benefit from the center as a result of increased tax base and the provision of a pleasant shopping environment.

4. The operation of the center will undoubtedly stimulate more healthy, active competition in retail sales, which should result in better service to the people of Portland.

5. The advantage of parking and unity of design of the center can best be insured by the continued central control of the development.

6. The center will create a demand for concentration of living facilities nearby. These facilities should be encouraged.

7. Broadway and Weidler, Union and Grand, 15th and 16th, and Oregon and Holladay, should be wide, one-way couplets serving as outer distributors to the center and also as through streets leading to the various sections of the city. Halsey, 15th and 16th, Multnomah and 9th, should be as wide as possible to serve as high capacity inner circumferential feeder streets to the center.

8. Since the Lloyd Corporation does not control and cannot dedicate all the property necessary for the widening of feeder streets, setbacks should be established on these streets to facilitate acquisition for future widening.

HIGHWAY LIGHTING

(Continued from page 17)

Some claimed that it was just another spectatular job—another case of good showmanship. Others felt, and rightly so, that these two installations represented a big step forward toward better, higher quality lighting.

Today, traffic frequently jams the bridges to capacity and beyond. What about the lighting? The same original sodium vapor installation is still in place and doing yeoman service. However, after 20 years the critics now say: "Isn't the lighting a little skimpy?"

Well, by today's standards it is—only about 0.7 footcandle or about half that which is now considered proper for the traffic density. We must recognize, however, that over two decades ago this job was considered more than adequate. It has stood the test of time pretty well, although we now consider that higher levels of lighting are required.

A new bridge has recently been built across San Francisco Bay north of Oakland at Richmond, California, and fluorescent lighting has been installed (Figure 9). The bridge has been opened nearly two years and the lighting has proved most successful.

Perhaps we have in the past set our sights too low. Maybe we could call it conservatism. In any event, we must admit that one of the reasons for the very existence of the current Federal Highway Program is that we have failed to keep pace with the demand.

Perhaps our horizons have been shrouded in fog. Perhaps we have found it difficult to clearly define our objectives. Whatever the reasons for our decision of the past, let us now get on with the job, set our sights high, and produce to the highest standards we know.

At the same time, let's keep a keen eye open for promising new developments that may appear on the horizon. By following such procedures, we will be planning ahead, charting our way using new developments as checkpoints to be sure we are on the correct course, but remaining flexible and ready to make corrections.

By the way, how broad are your horizons?

Institute Affairs

REPORT OF THE EXECUTIVE SECRETARY AT THE ANNUAL MEETING

1957-1958

The year 1957-58 has been a good one for the Institute of Traffic Engineers. Some major accomplishments can be reported, and plans for others are in the mill. On top of these, there has been a slow but steady growth in membership, income and prestige. The first two growth factors are more easily measured than the last, but we believe that in all three we have made progress.

Membership

The membership totals have been reported by the Secretary-Treasurer. Suffice it to say that the trend has been up for the twenty-eighth straight year —and that the rate exceeds ten per cent per year.

The number of applications which we are now handling is at the rate of 175 new applications and 75 transfer requests a year. The load on the headquarters office, the Membership Committee and the Board of Direction is increasing in direct proportion.

Finances

The financial report shows we are holding our own. We are achieving this, however, by means of doing only what we have been doing and not undertaking new projects. The increased membership list means increased expenses for the magazine, Proceedings, and every mailing. Too, costs are rising—recent postage increases being only one example. Everything we buy or do costs more than it did even a year ago.

New revenue sources or an increased rate of income must be obtained if we are to undertake more work or new responsibilities. Our magazine pays its own way, and gives us a little besides. In fact, it is our major source of income now as it has been for many years. Your patronage of the advertisers—and your acknowledgment to them that you know of their advertising in TRAFFIC ENGINEERING magazine —is more important than I can tell you. If any of your present suppliers do not now use the magazine as an advertising medium, please encourage them to do so.

Traffic Engineering Magazine

The magazine is very important to us as I have said. It has experienced a steady increase in circulation, and the non-member subscribers (*paid* subscribers, by the way) now outnumber the members of the Institute who of course receive the magazine as part of their regular services for their dues.

Various suggestions have been made of ways to improve the magazine, and I am grateful for all of them. Most of them are that we print better technical articles—a suggestion which I heartily endorse. Unfortunately I can only print what I have available or can obtain. We are reprinting less material than a couple of years ago, and we are always looking for more and better articles. You can help by sending in your contributions and ideas—and by responding when you are asked to write on a particular subject.

We have some plans now to step up the quality of the magazine by using the part-time services of a professional editor—if we can have the money to pay him. We think this will improve the magazine in many ways and make it a more useful tool for you.

Technical Activity

Technical activity of the Institute will be reported by the Chairman and Secretary of the Technical Council, and I will limit my comments to a few points.

We started the year with 33 technical committees. During the year we published reports from six of these. Two more are in the final stage before publication.

Of those published, one committee had three items in print—the revisions in the signal head and controller standards previously published as technical bulletins of the Institute. The revisions have now been approved by the American Standards Association and will be reprinted in booklet form by us.

Another point is worth mentioning in connection with the technical activity. In the case of one recent committee report, the Technical Council suggested a "review panel" of perhaps fifty members who had more than average knowledge of the subject. Copies of the report were sent out from headquarters to such a list, and almost everyone replied, with almost a third taking the time to write a careful review or critique of the report. The experiment, for that is what it was, seems to have worked successfully and will probably be used in other cases.

One final point in regard to technical activity is related to something mentioned earlier. If help can be obtained for the magazine editing job, then the Executive Secretary will have time available to devote to the technical activity. Staff work for the Technical Council and for as many of the committees as possible can be a headquarters operation, as it probably should be. The result will, we hope, be a substantial stepping up of technical committee output.

Local Sections and Student Chapters

There are currently 14 local sections and all have been more or less active this past year. The Executive Secretary has visited eight of these during the year and all but two of the 14 within the past 18 months.

A second productive meeting of section officers with the Board of Direction has just been held. Still in the mill is a proposed manual of section operations, which has been stalled by lack of headquarters staff time.

Five student chapters functioned last year—at Cornell, Illinois, Northwestern, Purdue and Yale. We believe all of these will continue this year.

Freeway Seminars

The Freeway Seminars have probably been the outstanding feature of the past year for the Institute. These have been described to you already, both as to technical content and schedule. Let me add to this by saying that it is evident to me that this program has done more to create an awareness and understanding of the Institute and to enhance the prestige of the organization than any other single thing in recent years.

Insurance

We are now firmly into our life insurance program, nearly at the end of our second year. As of today, there are 376 individuals covered by the plan. Of these, 133 are Members, 160 are Associate Members, 61 are Juniors, 20 are Affiliates, and two are employees. We would like to have more enrolled in the plan.

Benefits have been received in six cases. One of these is a case of permanent total disability, for which a waiver of premium has been granted. The other five are death cases, in which we have paid widows a total of $42,500. This is money which these women and their children would not have had if it had not been for the Institute's insurance program. I think it is a fine thing that the Institute could be of help in these instances of need.

Summary

The year has been a big one in many ways for the Institute. We have more members and a bigger budget, have published more pages in the magazine, have printed a bigger Yearbook, issued more committee reports, and have in general made a greater impact on the highway field.

Next year is a challenge for all of us—but one which we can meet if we work together. I pledge my best efforts as your headquarters office representative, and I ask for your continued advice and support.

Respectfully submitted,
DAVID M. BALDWIN
Executive Secretary

TRAFFIC NEWS

(Continued from page 32)

come the basis for a new set of roadway lighting standards for the illumination of highways throughout the country.

JOB CHANGES

Norman C. Barnett—From Palmer & Baker, Inc., New Orleans, to Sioux City, Iowa as Traffic Engineer.

Roy D. Cowley—from the British Columbia Department of Highways to the Department of Transport, Province of Ontario, as Traffic Engineer.

William D. Heath—from the D.C. Department of Highways and Traffic to the D.C. Motor Vehicle Parking Agency, as Executive Director.

Philip M. Linscott—from DeLeuw, Cather & Company, Los Angeles, to Daniel, Mann, Johnson & Mendenhall, Los Angeles, as Public Works Consultant.

Junius H. Payne — formerly with the Florida State Road Department in Tallahassee, now a Consulting Engineer in Magnolia, Mississippi.

George C. Villegas — from DeLeuw, Cather & Company in San Francisco to the Automobile Club of Southern California, Los Angeles, as Traffic Engineer.

Among the many committees meeting in Miami was Committee 6A, Parking Garages. Standing—Left to Right: W. Edward Ewens, Director of Traffic, Hamilton, Ontario; Arthur C. Gibson, Traffic Engr. Assoc., Detroit, Michigan; James V. Musick, Director of Traffic, Columbus, Ohio; Eugene A. Barton (Committee 6A Chairman) Cleveland, Ohio; Robert A. Keith, Washington, D.C., and Robert Burton, Toronto, Ontario.

Seated—Left to Right: William R. McGrath, Dir. of Traffic, New Haven, Conn.; William L. Carson, A.A.A., Washington, D.C.; William R. B. Froehlich, Exec. Dir., Pittsburgh Parking Authority; Luis Rodriguez, Traffic Engr., San Juan, Puerto Rico, and Edmund R. Ricker (Head of I.T.E. Dept. #6,) New Jersey Turnpike Commission.

Also present but not in picture were Committee members: Jos. Feuchter, St. Louis, Mo.; Kenneth Vaughan-Birch, Vancouver, B.C., and Robert Kelly, Cleveland, Ohio.

Alden W. Welch—formerly Research Editor for the American City Magazine, New York City, now Secretary of the Buttenheim Publishing Corporation, New York City.

TITLE CHANGES

Keith E. Bushnell—from Traffic Signal Engineer to Electrical Devices Engineer in the Michigan State Highway Department, Lansing.

E. F. Gillies — from Reflective Materials Engineer to National Sales Manager of Reflective Products for the Minnesota Mining & Manufacturing Company of Canada Ltd., London, Ontario.

Ervin R. Leiser—from Deputy Traffic Engineer to Senior Traffic Control Engineer, Bureau of Traffic Engineering and Electrical Services, Milwaukee.

James E. Loughran—from Traffic Engineer, Federal Defense Administration, to Chief of Movement Section, Emergency Community Services, Plans and Operations, Office of Civil Defense Mobilization, Battle Creek, Michigan.

Dwight M. McCracken — from Assistant Vice President, Liberty Mutual Insurance Company, to Vice President and Manager of Motor Transport Bureau, Boston.

Robert G. Mitchell — from Senior Highway Engineer to Assistant to the Chief of Planning, Traffic and Design, Connecticut State Highway Department, Hartford.

J. R. Stone—from Senior Traffic Engineer to District Maintenance Supervisor, Texas Highway Department, Fort Worth.

FOR 1959 YEARBOOK

If you have moved or changed jobs, send us a change of address so we can list you properly in the 1959 ITE YEARBOOK.

Title ..... (Position) (Branch)

Organization .....

☐ **Address** ..... (No.) (Street)

City ..... (City) (Zone) (State)

Telephone ..... (Spell Out Exchange)

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Check preferred mailing address.

..... (Print or Type Name)

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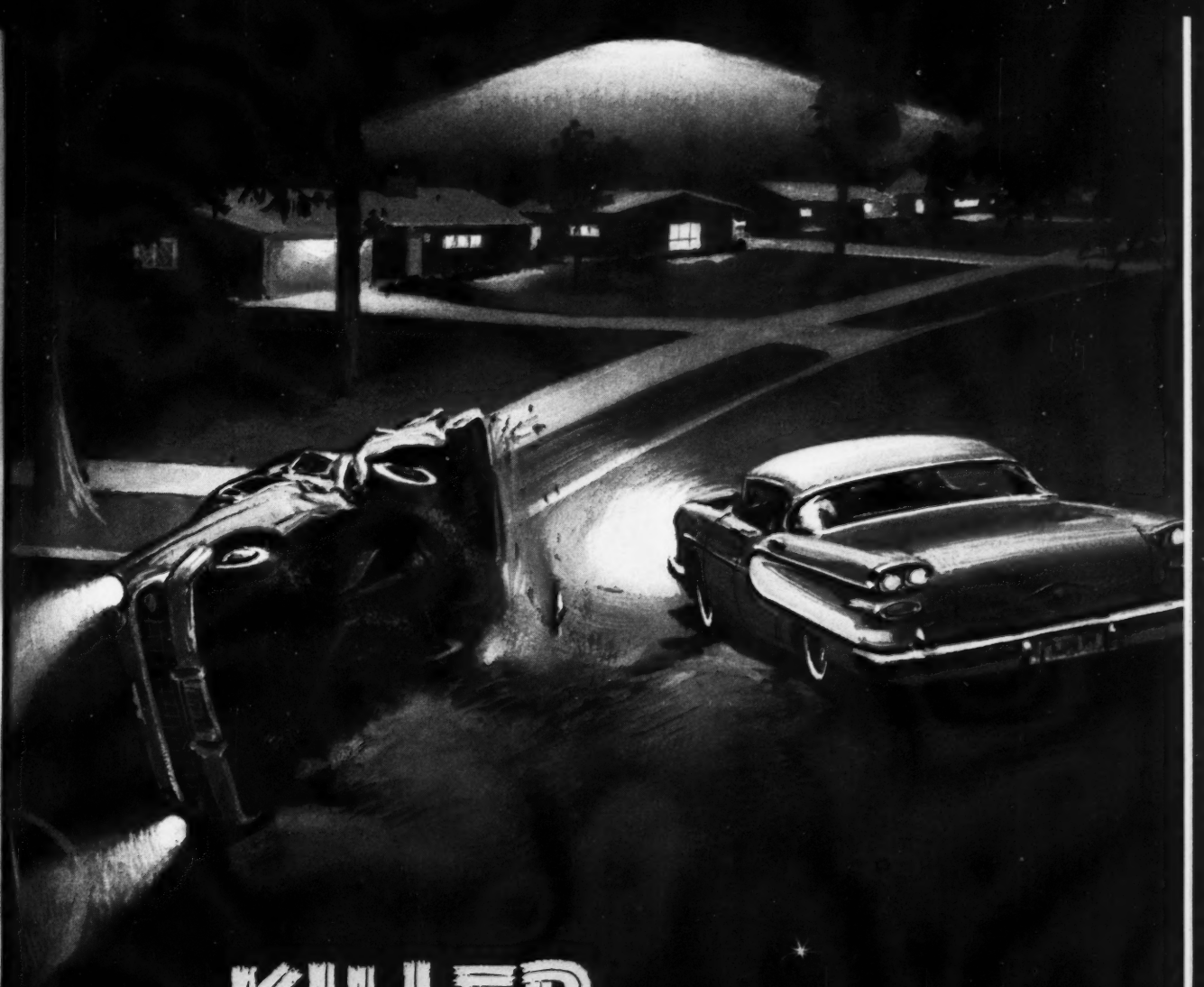

KILLER IN THE DARK...

This is a warning sign that didn't warn . . . a sign that went "off duty" at dusk . . . and became a "*Killer in the Dark!*"

Better think twice about using such signs. Non-reflectorized, they provide no protection for night drivers . . . give no warning of impending disaster that may lie only moments away. Many have perished because of them . . . more will die this year. How many will fall within your scope of authority?

Cataphote Reflective Traffic Signs *and* Street Name Signs can play a major role in your fight for safer streets and highways. Extreme durability makes them economical, too. Cataphote's method of reflectorization protects the sign . . . provides longer life . . . at a cost far below other methods.

Write for complete information today . . . and remember, when safer signing is installed, someone will get the credit. Will it be you?

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Manufacturers of: CATAPHOTE REFLECTIVE BEADS • CATAFLEX REFLECTIVE COATING • CATALINE REFLECTIVE STRIPING
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Section News

MIDWEST SECTION

Although there were no formal meeting sessions of the Midwest Section during the summer months, the annual Midwest Section Picnic filled the void of formal inactivity. The picnic was held on Sunday, August 3rd, at Bill Marston's Woodmar Estate. The weatherman cooperated to make it a very enjoyable day. A total of 87 youngsters were on hand to participate in the foot races, baseball, swimming, and food consumption. The only casualty noted was Harold Rowbottom, who suffered a swollen eye after coming out second best in an encounter with an uninvited winged insect.

The regular meeting schedule of the Midwest Section began again in the fall. Sixty-one members were in attendance at the September meeting of the section, held at Ray Harrington's Hall in Logan Square. From a vantage point near the door, many of the area's prominent T. E.'s could be observed dashing in and out—feeding their parking meters. The main feeding occured inside, and consisted of the specialty of the house: corned beef and cabbage.

Convening the meeting after the food was devoured, President John Zimmerman introduced the guests present: Dave Baldwin of the General Staff in Washington, Chuck Haley of Phoenix, Badgers Wayne Volk and John Bunch, John Baerwald of the Fighting Illini, and the ever-present Art Dierstein. President John also made a special welcome to a former section member who has returned to the fold: Tom Wiley. Self-introductions by the remainder of the group revealed that most of the section members had survived the summer without apparent undue strain. The social portion of the program included a movie entitled "World Series Highlights" and a Disney film short on traffic.

The October meeting, held in conjunction with the National Safety Congress, took place at the Chicago Engineers Club on Monday, October 20th. A large number of members and guests enjoyed the story and pictures of the recent European trip by Midwest member and National Director Bill Marston. Because the major part of this trip was behind the Iron Curtain, a Russian motif, including printed Russian menus and Vodka served at the dinner table, embellished the occasion.

Toll Roads Open

On August 20, 1958, after the inevitable speech-making and ribbon-cutting ceremonies, the first portion of the 187-mile Illinois Toll Road system was opened to traffic. The 85-mile Northwest Tollway, one of three toll routes in the state scheduled to be completed by the end of the year, connects O'Hare Field, on Chicago's Northwest Side, with Rockford and South Beloit. This toll road will be connected in a few years with downtown Chicago by means of the Northwest Expressway; free expressways in Wisconsin will also carry traffic from its present western terminus to Madison and the Minneapolis-St. Paul area.

On August 27, a 30-mile portion of Illinois' Tri-State Tollway was opened. The remainder of this toll route, which provides a bypass around Chicago, will be finished by January 1, 1959. The East-West Tollway, which will carry traffic from the Aurora area to the western end of the Congress Street Expressway, is now expected to be open for business some time this coming November.

TEXAS SECTION

The Annual Meeting for the Texas Section of I.T.E. was set during the Corpus Christi meeting for January 31, 1959. Walter Klapproth is Chairman of the Coordinating Committee for this fifth annual meeting. He has his committee appointed and definite progress has been made for housing and entertainment.

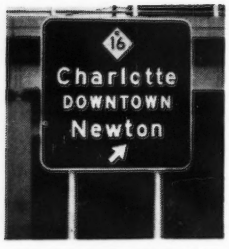
Your Vice President, Bill Brandes, has appointed Charles J. Keese as Chairman of the Committee for arranging the technical sessions. Jack and his Committee are working hard at this and are lining up good speakers for the entire technical program.

San Antonio Area

Carl Braunig reports that his program in District 15 of the Highway Department is looking good. He has a staff of ten people working on Traffic Engineering functions, including Ted Ozuna, a graduate of this Spring's short course, and Dick Pena, who is developing into a very capable Traffic Engineer. Carl says that his 1959 program includes about $250,000 for signal installations and about $50,000 for overhead signing. Stewart Fischer is almost as happy

(Continued on page 46)

"Cuts maintenance to the bone"



PACKAGED SIGNS SPEED INSTALLATION

To the natural advantage of light weight, Tassco provides these aluminum signs in pre-arranged packages ready for installation. The easy-to-handle panels are assembled on the job site and mounted in a matter of minutes.

TASSCO

This is North Carolina's new Route 85, by-passing cities, moving traffic quickly with the help of a signing program by Tassco. The complete program consists of ground mounted and overhead signs. The signs themselves are increment sheet signs developed by Tassco especially for use on modern, high-speed roads. They can be had in any height or width and are designed to meet 100 mph wind loads. The use of increment sheets means new lows in the cost of both materials and installation. But what is most important, since the State has to bear the costs of maintenance, is that with 1193 signs, 501 sign supports, and with 9 large sign spans, not one drop of paint is required for maintenance.

North Carolina's signs feature the approved reflectorized green background with white AGA letters. However, reflective material or painted backgrounds are available in any type letters or symbols.

Helpful data, including a full color movie, is available from the Tassco-P & K Highway Planning Committee. Write for "Committee Data" today.

TRAFFIC AND STREET SIGN COMPANY

84 FOUNDRY STREET, NEWARK, N.J.

SIGN-MAKING IS EASY WITH STIMSONITE® LETTERS

You can lay out signs on the spot with Stimsonite letters—you don't need costly production equipment or special fasteners.

The unequalled readability of Stimsonite cutout letters, day or night, in all kinds of weather, has been proved by years of service. The wide range of alphabets offered by Stimsonite is unequalled, too. For your signing needs, you can choose from over 1000 different letters and accessories—ranging from 4 inches to 30 inches in height—capitals or upper and lower case.

Get the whole story. Write today for Bulletin S-4C on spacing rules and letter dimensions.

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WORLD LEADERS IN STREET STRIPING

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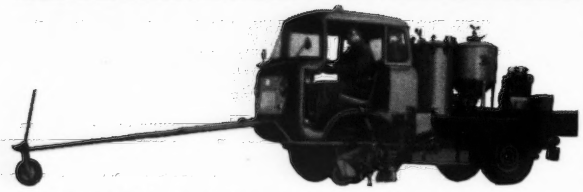
FOR METROPOLITAN CENTERS



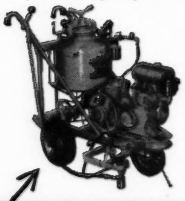
THE TOWN & COUNTY: Revolutionary all-purpose Push Button Striper with exclusive built-in advantages. One-man operation. Automatic, electric controls for patterning lines and regulating intermittent advance and retard. Compact . . . maneuverable . . . soon pays its cost in time and labor savings.

MODEL 16: Designed for one-man striping in the thick of traffic, equipped with the newest mechanisms for instantaneous positive drive. Ideal for both *single* and *double* line work, built for long life and economical operation. Self propelled.

FOR LARGE AND MEDIUM CITIES

MODEL 12: The original Reflecto-liner, light, fast, easy to handle. For single lines with clear-cut edges, 2 to 6 inch widths, this striper beats anything on the market. Wald's double-acting elbow traction gives it smooth, positive self-propelled driving power.

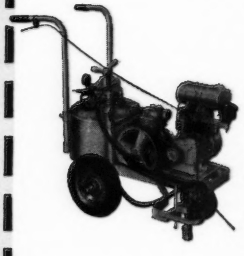
MODEL 8T: This light-weight, single-line self-propelled spray machine is unmatched in its field. It has strength and versatility, does a terrific job on streets, cross-walks, parking areas, aisles or any location requiring fast backing and turning.



For Small Cities, Towns and for Industry

MODEL 8T, described above, outperforms by a wide margin every other small machine available, making it ideal for small cities and towns that need a self-propelled unit.

REFLECTO-LINER JR.: A rugged, hand-propelled striper that gives top performance in industrial uses, in-town striping, parking lots, etc. A gem of Wald engineering that handles as easily as a vacuum cleaner. Designed for the small municipality at a budget price.



All Wald Reflectoliners Handle Ordinary Non-Reflective Paints as well as Reflective Marking Materials with Equal Ease

New General Catalog W-58 Is Now Ready With Specification Charts and Full Details On All Wald Reflectoliners, Accessories and Equipment Including The Famous Wald Automatic Sign Shop

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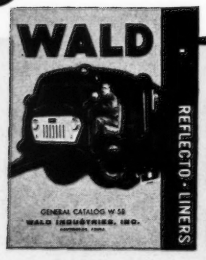
Please send immediately your illustrated General Catalog W-58.



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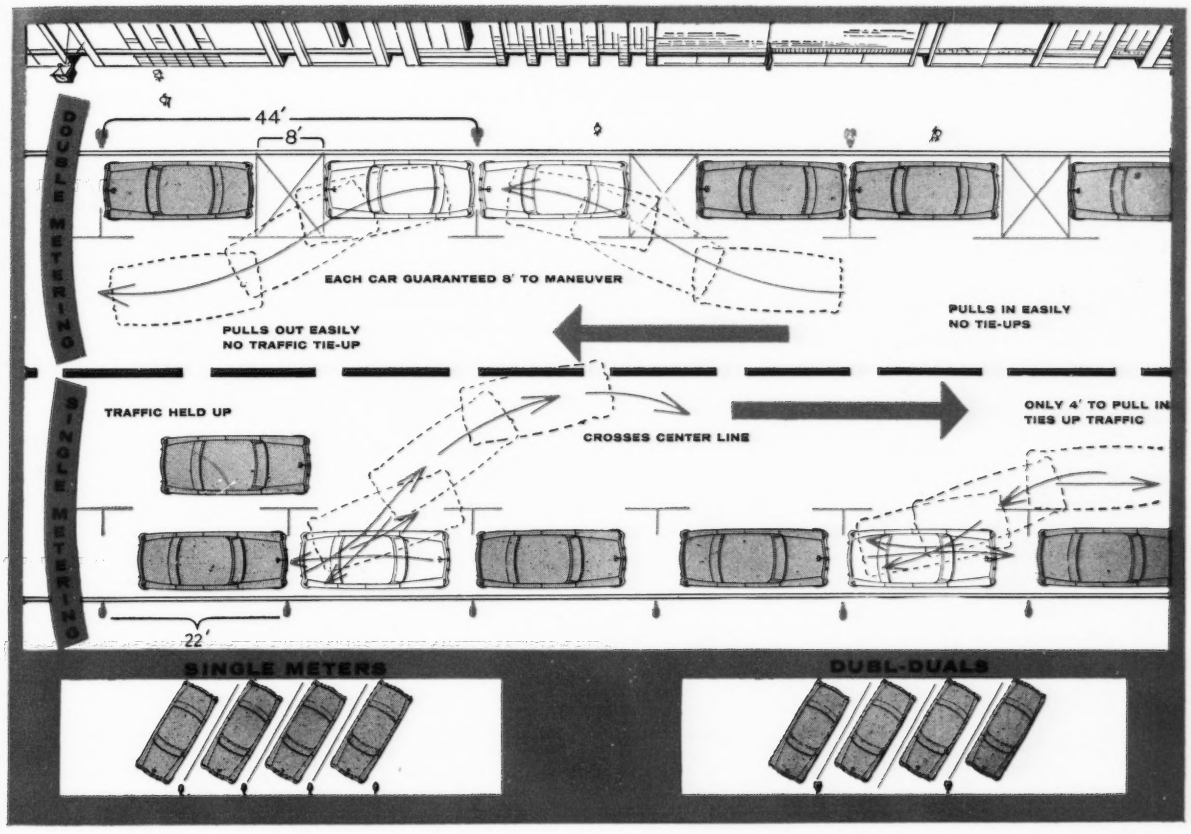
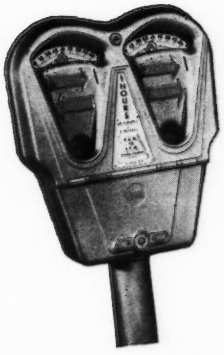
WALD . . . "The World's Greatest Name in Marking Equipment"

HOW TO MAKE THE MOST OF EXISTING PARKING SPACE



Only Dubl-Duals get the most out of existing parking space and reduce metering costs 27% in the bargain



The drawing above shows clearly how Dubl-Dual Parking Meters insure eight full feet between cars while single meters often reduce space to only four feet. Note too how traffic flows more easily and safely when cars are assured adequate room to maneuver into and out of the parking spaces.

But greater utilization of parking space is only part of the Dubl-Dual story. Since Dubl-Duals are two separate meter mechanisms in a single case, initial cost is lower. And installation costs are reduced because only half as many meter stand installations are required. Dubl-Duals also reduce collection and inspection time . . . every other meter "stop" is eliminated.

There are lots of sound, proven reasons why your community should investigate the economy and efficiency of Dubl-Dual metering. Send the coupon for complete details in the new, booklet on Dubl-Dual Parking Meters. Dual Parking Meter Co., Subsidiary of Rockwell Manufacturing Co., Pittsburgh 8, Pa.

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☐ Please have your representative call.

Name_____ Title_____

City_____

State_____

SECTION NEWS

(Continued from page 42)

about this as Carl, because about 80% of this is scheduled for San Antonio.

Al Groves is leaving the services of the City of San Antonio to join a local consulting firm.

Stew Fischer has ben receiving resignations with alarming frequency. Since May 1, he has lost two secretaries (to be married), one Junior Engineer (to the Army) one Investigator (couldn't compete salary-wise) and one Assistant, Al Groves. If things continue, Stew will be where he started six years ago.

Houston District

F. Norman Hill is spending a considerable amount of his time in Dallas these days in the construction of a new freight terminal.

There was so much State work going on in and around the City of Houston for a while during the early part of this summer that Cooper McEachern thought he was on a "Lend-Lease" basis to the State.

Dave Fielder and Frank Watson are now known as 16752 and 16710, respectively. Both were notified recently that these are the serial numbers of their Professional Engineers License.

Between striping and new street signs, one has to make an appointment to even talk to Neill Amsler on the telephone.

Herman Haenel has left for Yale and a year of intensive study.

Tom Willier states that the bulk of his work these days centers around parking garages and the downtown section of Houston. In the past six years, Tom has been retained on 50 civic shopping centers. However, this general trend has slowed down recently and there has been a renewed interest in the downtown section. Perhaps this is best illustrated in the fact that the Mayor of Houston has recently announced the appointment of a Transportation Commission and the voters approved a new 350-bed Charity Hospital in the $1 Million Medical Center. Also, the Harris County voters have approved a $20 Million Stadium so that professional football, baseball and other professional sporting events can be brought to Houston.

Dallas Area

Unscrambled! On July 28th, Dallas' one and only "scramble" signal installation was removed after four and one-half years of operation. This step was one of several recommendations of a Traffic Plan Committee appointed by the Mayor to devise means for alleviating downtown congestion. The increased freedom of movement on the two one-way approaches of the intersection was obvious.

Establishment of curb lanes for exclusive use of transit vehicles during the rush hours on Commerce and Elm Streets and the institution of several additional turn prohibitions in the downtown area were other recommendations of the Committee placed in effect.

Orchids are due the Fort Worth District State Highway Office and Bill Welty (the designer) for the new sign supports being erected on the East - West Expressway in Fort Worth. The design and fabrication of these supports is unique and worthy of attention by others responsible for expressway signing.

Dallas has received its new Crouse-Hinds traffic density master control equipment for the downtown signal system. It is hoped to have it installed and in operation by fall.

The Dallas Division of Traffic Signals and the Division of Signs and Markings has recently moved into a new building 50′ x 240′. All of the office area in the center of the building is air conditioned, as well as the sign fabrication rooms and the traffic signal work shop. One of the additions acquired in connection with the new building, of which they are most proud, is a base radio station and eight two-way mobile radio units for their field trucks. These have increased the efficiency of their field operations tremendously.

Austin District

Bill Welty reports that the Highway Department has recently erected their latest design of Tee Mounts and Sign Bridges at Fort Worth. The sign bridge is an 80′-0″ x 20′-0″.

Bill has been developing a computer program for traffic signal analysis. The programming has just been completed for our IBM-650 for computation of the plus wire sizes for a traffic signalized intersection. The other parts of the problem which will be completed next are the size of ground wires, conduit size, and search of the phase diagrams to determine which signal lenses can be connected in the same circuit.

Joe Wright is in El Paso to make a comprehensive traffic study of the area. This study will be the first made by the Department in which the data will be analyzed by the IBM-650 Computer.

Lubbock Area

B. H. McDaniel, one of our new members, and Traffic Engineer at Lubbock, has just completed the installation of a 1033 at the intersection of 34th and College. This is the first volume density signal to be installed in the City of Lubbock.

Fort Worth District

The City of Fort Worth is still urging Bim Greer's office to approve and let contracts for signal locations where we have had temporary signals for two years. We do wish to congratulate the Highway Department on the very fine Tee Mounts and overhead signs recently installed on our Expressways.

Officers of the Texas Section have met several times during the summer trying to formulate plans for the Fort Worth-Dallas Area Freeway Operations Seminar. T. R. Buckman has been appointed as Chairman of the Local Arrangements Committee with past president Jim Saylor, as Vice Chairman. The dates have been set for February 2, 3 & 4, 1959, and it is to be held at the Western Hills Inn on Highway 183 between Fort Worth and Dallas, near Amon Carter Field.

Yearbook Changes

BARKLEY, Robert E. (Associate)
Executive Director, Redevelopment Commission, City Hall, Greensboro, North Carolina. BRoadway 5-7319.

BATE, Stuart M. (Member)
Route #2, Box 273, Escondido, California.

BUSHNELL, Keith E. (Associate)
Electrical Devices Engineer, Michigan State Highway Department, Stevens T. Mason Building, Lansing, Michigan. IVanhoe 5-8144, Ext. 2564.

BUTTZ, Charles W. (Junior)
Traffic Engineer, Tippetts-Abbett-McCarthy-Stratton, 62 West 47th Street, New York 36, New York. PLaza 7-8000.

CABRERA, Isaac T. (Associate)
Safety Expert, International Labor Office, Geneva, Switzerland. SEND MAIL: Apartado No. 2665, Caracas, Venezuela.

CANTILLI, Edmund J. (Junior)
Highway Project Planner, Port of New York Authority, 111 Eighth Avenue, New York 11, New York. ALgonquin 5-1000, Ext. 8064.

CLYDE, Max N. (Junior)
Engineer of Geometrics, Michigan State Highway Department, Stevens T. Mason Building, Lansing, Michigan. IVanhoe 5-8144, Ext. 2571.

COLBY, Edwin F. (Member)
Traffic Engineer, Bruce Campbell & Associates, 177 Milk Street, Boston 9, Massachusetts. LIberty 2-0512.

COWLEY, Roy D. (Associate)
Traffic Engineer, Ontario Department of Traffic, Parliament Buildings, Toronto, Ontario, Canada. SEND MAIL: #210-1002 Lawrence Avenue East, Don Mills, Ontario, Canada.

DIER, Robert D. (Member)
City Traffic Engineer, Room 334 Kennebec Building, 141 West Ocean Boulevard, Long Beach 2, California. HEmlock 6-9041.

FEDERHART, James W. (Associate)
City Traffic Engineer, City Hall, Saginaw, Michigan. PLeasant 5-0531. SEND MAIL: 248 Borland Court, Saginaw, Michigan.

GILLIES, E. F. (Associate)
National Sales Manager, Reflective Products, Minnesota Mining & Manufacturing Company of Canada Limited. P.O. Box 757, London, Ontario, Canada. GLadstone 1-2500.

HALE, Peter P. (Associate)
Vice President, Technical Planning Associates, Inc. 193 Dwight Street, New Haven 11, Connecticut. LOcust 2-0642.

HAMPTON, William B. (Associate)
Deputy Director, Motor Vehicle Parking Agency, 499 Pennsylvania Avenue, N. W. Washington 21, D. C. NAtional 8-6000, Ext. 2250.

HEATH, William D. (Associate)
Executive Director, Motor Vehicle Parking Agency, 499 Pennsylvania Avenue, N. W. Washington 21, D. C. NAtional 8-6000, Ext. 2250. SEND MAIL: 1111 Army Navy Drive, Arlington 2, Virginia.

HENBERGER, John C. (Associate)
Manufacturer's Representative, John C. Henberger Company, 3536 Crown Point Drive, San Diego 9, California. HUdson 8-0317.

HUTTER, Jack A. (Member)
Traffic Engineer, George W. Barton & Associate, 600 Davis Street, Evanston, Illinois. UNiversity 9-0660.

IRELAND, Eugene F. (Associate)
Traffic Signal & Illumination Engineer, Washington Department of Highways, Transportation Building, Olympia, Washington. FLeetwood 2-3354. SEND MAIL: Route 5, Box 44, Olympia, Washington.

LEISER, Ervin R. (Associate)
Senior Traffic Control Engineer, Bureau of Traffic Engineering & Electrical Services, Room 804, City Hall, Milwaukee 2, Wisconsin, BRoadway 6-3711.

LEITCH, Kenneth (Junior)
Traffic Engineer, Queensland State, 100 Mary Street, Brisbane, Queensland, Australia. 2-4756.

LOUGHRAN, James E. (Associate)
Chief, Movement Section, Emergency Community Services, Plans & Operations, Office of Civil & Defense Mobilization, Room 2-4-67, Battle Creek, Michigan. WOodward 2-6511.

McCRACKEN, Dwight M. (Member)
Vice President, Manager, Motor Transport Bureau, Liberty Mutual Insurance Company, 175 Berkeley Street, Boston 17, Massachusetts.

MITCHELL, Robert G. (Associate)
Assistant to the Chief, Planning, Traffic and Design, Connecticut State Highway Department, State Office Building, Hartford, Connecticut. JAckson 7-6341. SEND MAIL: King Street, Warehouse Point, Connecticut.

STONE, J. R. (Associate)
District Maintenance Engineer, Texas Highway Department, P. O. Box 6868, Fort Worth, Texas. WAlnut 6-1711.

SUMNERS, James H. (Associate)
Office Operations Engineer, Traffic & Planning Division. Mississippi State Highway Department, P. O. Box 1638, Jackson, Mississippi. FLeetwood 2-8831.

TARBOX, Frederick C. (Member)
Chief Traffic Engineer, Onio Department of Highways, 450 East Town Street, Columbus, Ohio. CApitol 8-5791, Ext. 26. SEND MAIL: 2061 Waltham Road, Columbus 21, Ohio.

VENABLE, Clinton A. (Junior)
E. I. T. Design, Indiana State Highway Department, 102 North Senate Street, Indianapolis, Indiana. MElrose 5-9521, Ext. 396. SEND MAIL: 6033 Meadow Park Drive, Indianapolis 26, Indiana.

VILLEGAS, George C. (Associate)
Traffic Engineer, Automobile Club of Southern California, Box 2890 Terminal Annex, Los Angeles 54, California. RIchmond 8-3111. SEND MAIL: 220 East Markland Drive, Monterey Park, California.

WADE, Philip E. (Junior)
Planning & Economics Engineer, Ontario Department of Highways, Queen's Park, Toronto, Ontario, Canada. EMpire 3-1211, Local 22581.

WELCH, Alden W. (Affiliate)
Secretary, Buttenheim Publishing Company, 470 Fourth Avenue, New York 16, New York. MUrray Hill 5-9252.

YOUNG, J. C. (Member)
Chief Highway Engineer, Porter, Urquhart, McCready & O'Brien, 961 Folsom Avenue, Salt Lake City, Utah. DAvis 2-1055.

Membership Applications

APPLICATIONS FOR TRANSFER

CHESTER, Robert C.
Associate Traffic Engineer, City Room 480, City & County Building, Denver, Colorado. November 3, 1958 for ASSOCIATE grade.

COLEMAN, Captain James E.
Special Projects Officer (Highway Traffic Engineer), Department of the Army, OSATE, Office of Chief of Transportation, Washington 25, D. C. October 7, 1958 for ASSOCIATE grade.

FAULKNER, Z. A.
City Traffic Engineer, Municipal Building, Evanston, Illinois. October 24, 1958 for MEMBER grade.

FRINK, Leslie M.
Traffic Engineer, City, 636 Garden Street, Santa Barbara, California. November 3, 1958 for ASSOCIATE grade.

GRAVES, Paul B.
City Traffic Engineer, City Building Annex, 104 South Main Street, Wichita, Kansas. October 20, 1958 for ASSOCIATE grade.

HAMMOND, Daniel S.
Chief Engineer, Bruce Campbell & Associates, 177 Milk Street, Boston 9, Massachusetts. November 7, 1958 for MEMBER grade.

KOERT, Adrian H.
City Traffic Engineer, City Hall, Des Moines, Iowa. October 9, 1958 for MEMBER grade.

LEISER, Ervin R.
Senior Traffic Control Engineer, Bureau of Traffic Engineering & Electrical Services, Room 804, City Hall, Milwaukee 2, Wisconsin. October 20, 1958 for MEMBER grade.

LITCHFORD, James O.
Design Engineer, Charles M. Upham Associates, Box 602, Tripoli, Libya, North Africa. October 27, 1958 for MEMBER grade.

LOUGHRAN, James E.
Chief, Movement Section, Office of Civil & Defense Mobilization, Room 2-4-67. Battle Creek, Michigan. October 17, 1958 for MEMBER grade.

PETERSON, Robert G.
Assistant Traffic Engineer, City, 274 City Hall, St. Paul, Minnesota. November 10, 1958 for ASSOCIATE grade.

PIEDRAHITA, Jose A.
Consulting Traffic Engineer, City, Carrera 19 #11-17, Bogata, Colombia, South America. October 6, 1958 for ASSOCIATE grade.

ROTHWEILER, Gerald C.
Assistant Traffic Engineer, City & County, Room 480, City & County Building, Denver, Colorado. October 15, 1958 for MEMBER grade.

SMALL, James M.
Assistant Director of Planning, City & County, Room 481, City & County Building, Denver, Colorado. October 27, 1958 for ASSOCIATE grade.

TSIKNAS, John C.
Associate Traffic Engineer, City, 259 Civic Center, San Diego 1, California. October 27, 1958 for ASSOCIATE grade.

WILLIAMS, Earl C., Jr.
Traffic Engineer, City, City Auditorium, Wichita Falls, Texas. October 20, 1958 for MEMBER grade.

NEW APPLICATIONS

BASS, Donald E.
Traffic Engineer I, Wyoming Highway Department, Cheyenne, Wyoming. October 20, 1958 for JUNIOR grade.

BLINDAUER, Harlan H.
Research Engineer, Montana Highway Department, Helena, Montana. November 3, for JUNIOR grade.

BONE, Alexander J.
Associate Professor of Traffic Engineering, Massachusetts Institute of Technology, Room 1-153, Cambridge 39, Massachusetts. November 3, 1958 for MEMBER grade.

BURGER, Joseph P.
Administrative Assistant to the Traffic Engineer, City, Room 902, Municipal Building, Akron 8, Ohio. November 4, 1958 for ASSOCIATE grade.

BURGESS, Hector C.
Highway Markings Engineer, Connecticut State Highway Department, Hartford, Connecticut. November 3, 1958 for MEMBER grade.

CRIBBINS, Paul D.
Instructor, Civil Engineering Department, Purdue University, Lafayette, Indiana. November 10, 1958 for JUNIOR grade.

DARLOW, Arthur E.
Director, Department of Engineering, City, 3332 Pan American Drive, Miami 33, Florida. October 27, 1958 for MEMBER grade.

EGEBAEK, Vagn E.
Resident Designer, Texas Highway Department, Wichita Falls, Texas. October 14, 1958 for JUNIOR grade.

FARMER, Justin F.
Traffic & Planning Engineer, Porter, Urquhart, McCreary & O'Brien, 1140 Howard Street, San Francisco, California. October 10, 1958 for JUNIOR grade.

GALATI, Joseph V.
Assistant Traffic Engineer, City, Room 212 City Hall, Harrisburg, Pennsylvania. November 3, 1958 for JUNIOR grade.

HAGLUND, Marvin C.
Traffic Engineer, City, 1444 West Garvey Avenue, West Covina, California. October 13, 1958 for JUNIOR grade.

HIXON, C. Dwight
Traffic Plans Engineer, Nashville Traffic Commission, City Office Building, Nashville, Tennessee. November 3, 1958 for JUNIOR grade.

KOLOM, Lester L.
Traffic Engineer IV, Bureau of Street Traffic, Room 709, City Hall, Chicago 2, Illinois. October 10, 1958 for ASSOCIATE grade.

LACY, Joe M.
Planning & Traffic Director, City, P. O. Box 178, Englewood, Colorado. October 6, 1958 for JUNIOR grade.

ORTH, Lawrence M.
Traffic Investigator, Oregon State Highway Department, Room 313, Oregon State Highway Building, Salem, Oregon. November 4, 1958 for JUNIOR grade.

PETERSEN, Eugene J.
Director of Public Works, City, 10 North Bemiston Street, Clayton, Missouri. October 13, 1958 for JUNIOR grade.

RAMSEY, William A.
Traffic Engineer, City & County, 410 Jefferson Street, Pensacola, Florida. October 15, 1958 for JUNIOR grade.

STEGMAIER, Joseph T.
Highway Research Engineer, U. S. Bureau of Public Roads, Washington 25, D. C. November 6, 1958 for ASSOCIATE grade.

STROMBOM, Donald A.
Assistant Highway Engineer, Planning, Washington State Department of Highways, Transportation Building, Olympia, Washington. October 27, 1958 for JUNIOR grade.

STUBING, Henry D.
Highway Engineer, DeLeuw, Cather & Brill, 202 East 44th Street, New York 17, New York. October 24, 1958 for JUNIOR grade.

YOUNG, James T.
Senior Engineering Assistant, Texas Highway Department, P. O. Box 6868, Fort Worth, Texas. October 22, 1958 for JUNIOR grade.

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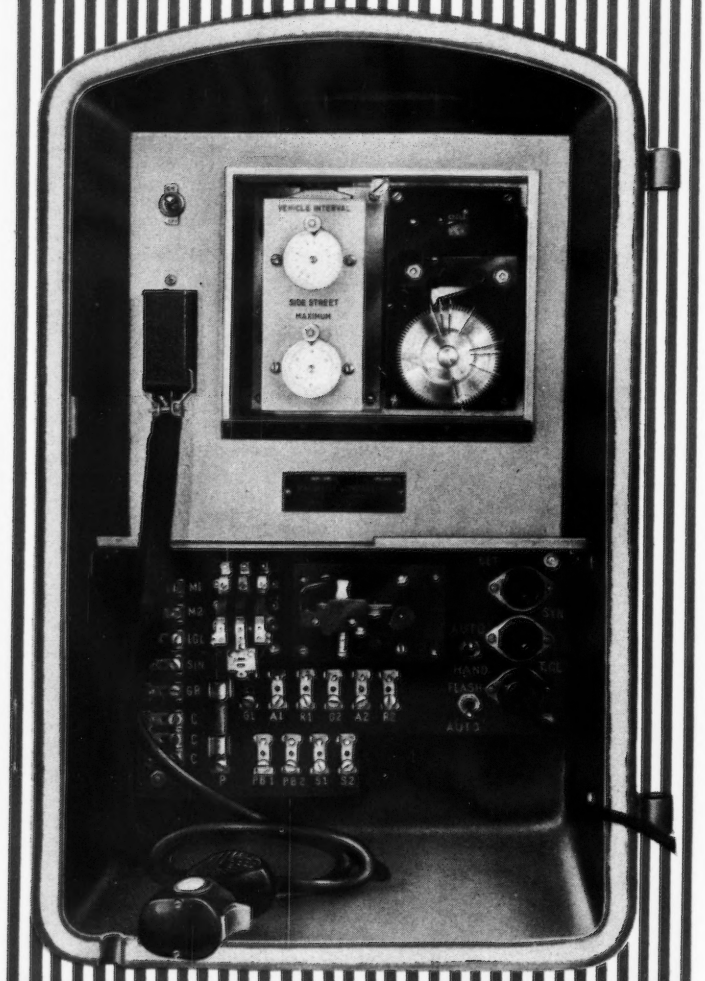

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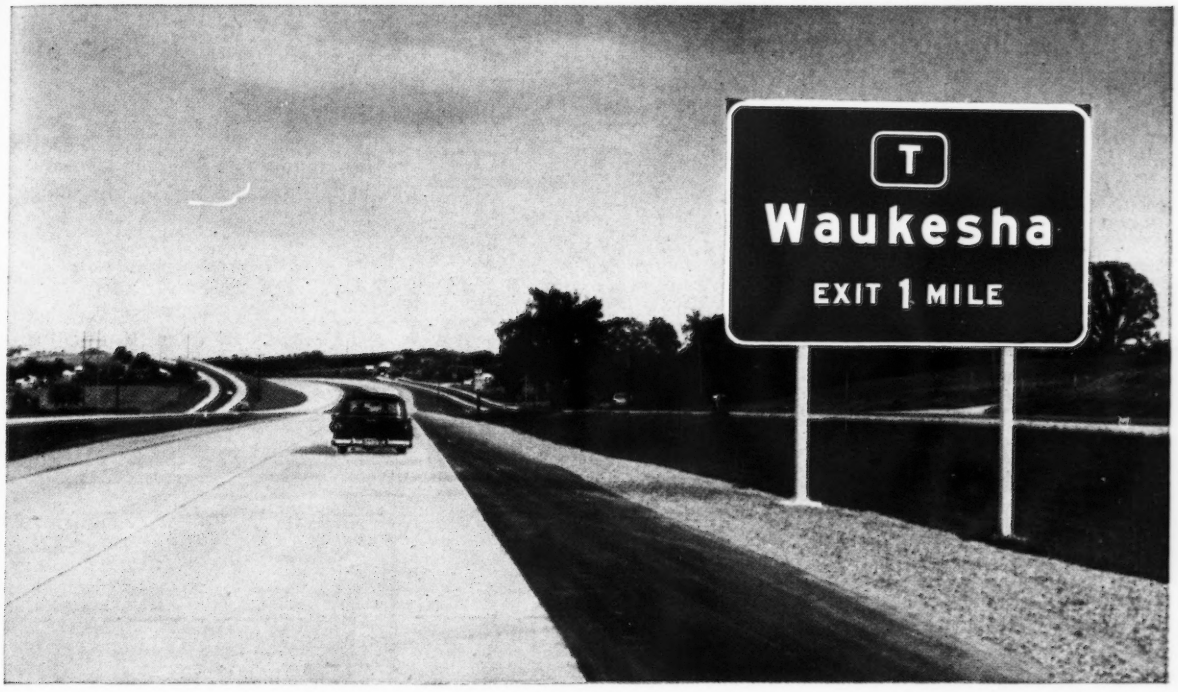

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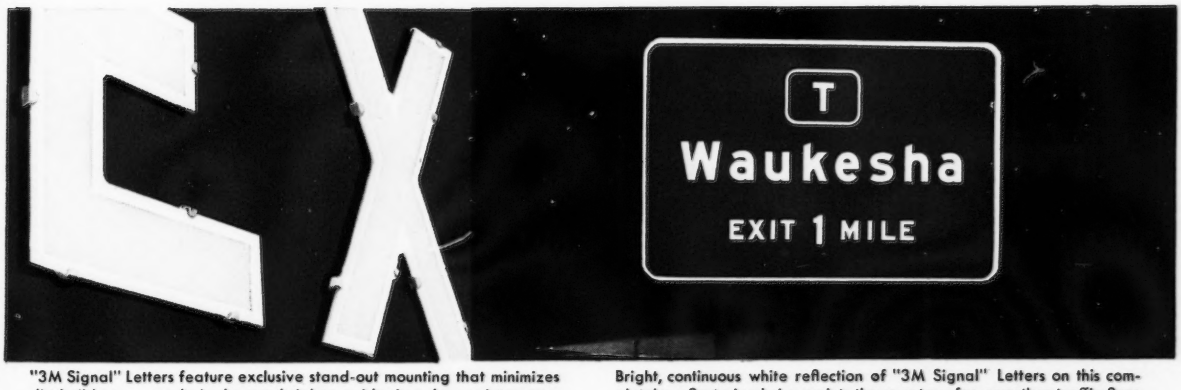

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New Members and Transfers

TRANSFERS

ADAMS, George S. (Associate)
Highway Engineer, Urban Planning Section, Georgia State Highway Department, #2 Capitol Square S. E., Atlanta, Ga.

BACCHUS, Grant A. (Associate)
Assistant Traffic Engineer, Metropolitan Toronto Planning Board, 133 Richmond Street West, Toronto, Ontario, Canada.

BARKER, John L. (Member)
Development Engineer, Automatic Signal Division, Regent Street, East Norwalk, Connecticut.

BORTON, Weldon L. (Associate)
Highway Traffic Engineer, Michigan State Highway Department, Stevens T. Mason Building, Lansing, Michigan.

BOSSI, Alfred A. (Associate)
Traffic Engineer, City Hall, 400 Stewart Avenue, Las Vegas, Nevada.

BOX, Paul C. (Associate)
Traffic Engineer, George W. Barton & Associates, 600 Davis Street, Evanston, Illinois.

BRAUNIG, Carl F., Jr. (Associate)
Traffic Engineer, Texas Highway Department, 2300 Roosevelt Avenue, San Antonio 10, Texas.

BROWN, James L. (Associate)
Traffic Signal Engineer, City & County of Denver, Room 480 City & County Building, Denver, Colorado.

BULLOCK, George W. (Associate)
Traffic Engineer, City Hall, Burbank, California.

BURNS, Harry F. (Member)
Traffic Engineer & Associate, A. D. Margison & Associates Ltd., 30 Eglinton Avenue East, Toronto, Ontario, Canada.

BYROM, Gustav A., Jr. (Associate)
Traffic Engineer, Municipal Building, Aurora, Colorado.

CHAFFEE, John L. (Associate)
District Traffic Engineer, Washington Department of Highways, North 2820 Mayfair Street, Spokane, Washington.

DUNN, Robert E. (Member)
Assistant Traffic Engineer, Washington Department of Highways, Transportation Building, Olympia, Washington.

EDENS, Hendrik J. (Associate)
Head, Traffic Engineering Section, DeLeuw, Cather & Co. of Canada Ltd., 1491 Yonge Street, Toronto, Ontario, Canada.

ELKOUBY, Joseph S. (Associate)
Chief, Traffic Planning & Research Division, Ministry of Public Works, 244, Boulevard Saint-Germain, Paris (7), France.

FLYNN, Earl H. (Member)
Traffic Engineer, Alfred Kaehrle Associates, 10 North Main Street, West Hartford 7, Connecticut.

GALLOWAY, William G. (Associate)
Assistant Director, Division of Traffic, Kentucky Department of Highways, Frankfort, Kentucky.

HENDRICK, Roe P. (Associate)
Traffic Engineer, Bruce Campbell & Associates, 177 Milk Street, Boston, Massachusetts.

HUDSPETH, Vealess F. (Associate)
Highway Research Engineer, Colorado Department of Highways, 4201 Arkansas Avenue, Denver 22, Colorado.

KAHOE, Edwin M., Jr. (Associate)
Assistant to the President, Philadelphia Transportation Company, 200 West Wyoming Avenue, Philadelphia 40, Pa.

KEEFER, Louis E. (Associate)
Chief Traffic Engineer, Pittsburgh Area Transportation Study, 14 Wood Street, Pittsburgh 22, Pennsylvania.

KELLY, Robert J. (Member)
Commissioner of Traffic Engineering & Parking, Room 400, 1404 East 9th Street, Cleveland 14, Ohio.

KOCH, Charles W. (Associate)
Assistant Staff Engineer, Coverdale & Colpitts, 1060 South Broadway, Los Angeles 15, California.

LARSON, Robert A. (Associate)
Assistant Planning Engineer, Wayne County Road Commission, 7th Floor, City-County Building, Detroit 26, Michigan.

LOUTZENHEISER, Donald W. (Member)
Chief, Highway Design Division, Office of Engineering, U. S. Bureau of Public Roads, Washington 25, D.C.

MURPHY, Charles J. (Member)
Director, Traffic Engineering & Safety Department, Automobile Club of New York, 28 East 78th Street, New York, New York.

NOERR, Karl (Associate)
Highway District Traffic Engineer, Virginia Department of Highways, Box 671, Culpeper, Virginia.

ROY, George R. (Associate)
General Planning Analyst, Port of New York Authority, 111 Eighth Avenue, New York 11, New York.

SHARP, J. Andrew (Associate)
Assistant Traffic Engineer, City, 223 James Avenue, Winnipeg 2, Manitoba, Canada.

THOMPSON, James A. (Associate)
Assistant Traffic Engineer, Missouri State Highway Department, Highway Building, Jefferson City, Missouri.

TIDD, Eugene L., Jr. (Associate)
Associate Traffic Engineer, Virginia Department of Highways, 1221 East Broad Street, Richmond 19, Virginia.

VANNICE, Robert E. (Associate)
Engineer of Special Projects, Cuyahoga County, 1900 Standard Oil Building, Cleveland 13, Ohio.

VAZQUEZ CABRERA, Julio E. (Associate)
Assistant Chief, Traffic Safety Division, Department of Public Works, Stop 22, Santurce, Puerto Rico.

NEW MEMBERS

BALI, Ahmet Ihsan (Junior)
Traffic Engineer, Turkish Highway Department, Karayollari 1. Bolge Md., Istanbul, Turkey.

BAULE, Charles L. (Junior)
Civil Engineer, Bureau of Street Traffic, Room 306, 320 North Clark Street, Chicago 10, Illinois.

BERGENDOFF, Raymond C. (Junior)
Project Planning Engineer, Howard, Needles, Tammen & Bergendoff, 1805 Grand Avenue, Kansas City 8, Missouri.

BILEK, Robert F. (Associate)
Traffic Service Supervisor, Chicago Park District, 425 East 14th Boulevard, Chicago 5, Illinois.

BLUNDEN, William R. (Associate)
Professor of Traffic Engineering, NSW University of Technology, P. O. Box 1, Kensington, Sydney, NSW, Australia.

BOYCE, Lindsay B. (Associate)
Traffic Engineer, Auckland City Council, Town Hall, Auckland, New Zealand.

BREUER, Robert (Junior)
Junior Civil Engineer, Department of Traffic, 100 Gold Street, New York 38, New York.

BURG, John S. (Associate)
Assistant Traffic Engineer, City & County of Denver, Room 480 City & County Building, Denver, Colorado.

BUSTAMANTE, Enrique (Junior)
Assistant Traffic Engineer, City, 118 South Campbell Street, El Paso, Texas.

CADE, John R. (Junior)
Principal Engineer, Traffic Safety, N. J. State Bureau of Traffic Safety, 32 East Hanover Street, Trenton, New Jersey.

CALLAND, William B. (Associate)
Associate Highway Engineer, California Division of Highways, P. O. Box 390, San Diego 12, California.

CASSERA, Vincent I. (Junior)
Traffic Engineer & Director of City Planning, City Hall, New Brunswick, New Jersey.

CEBALLOS, Guillermo G. (Junior)
Civil Engineer, Planning Division, Ministry of Public Works, Negociado De Urbanismo, Havana, Cuba.

CHRYST, Robert M. (Associate)
City Traffic Engineer, Public Safety Building, Lancaster, Pa.

COCHRAN, George A. (Junior)
Senior Traffic Analyst, Louisiana Department of Highways, Box 4245 Capitol Station, Baton Rouge, Louisiana.

CRAWFORD, George L., Jr. (Junior)
Traffic Field Engineer, Illinois Division of Highways, 9300 St. Clair Avenue, East St. Louis, Illinois.

CUNNINGHAM, Stuart A. (Associate)
Assistant Traffic Engineer, Delaware State Highway Department, New & Water Streets, Dover, Delaware.

DECKER, James D. (Junior)
Highway Engineering Trainee, Virginia Department of Highways, 1221 East Broad Street, Richmond 19, Virginia.

DODGE, Robert J. (Junior)
Associate Traffic Engineer, N. C. State Highway Commission, Highway Building, Raleigh, North Carolina.

DUNIVAN, Robert E. (Junior)
Assistant Engineer of Traffic, Florida State Road Department, Holland Building, Tallahassee, Florida.

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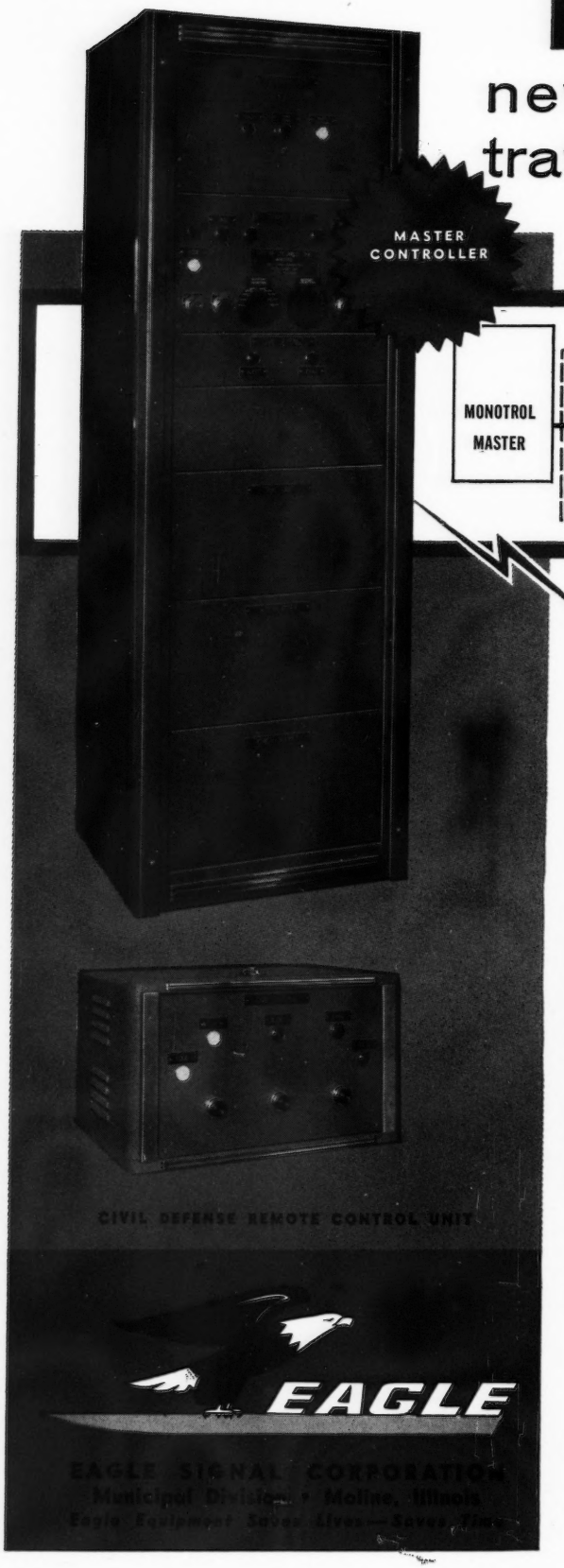

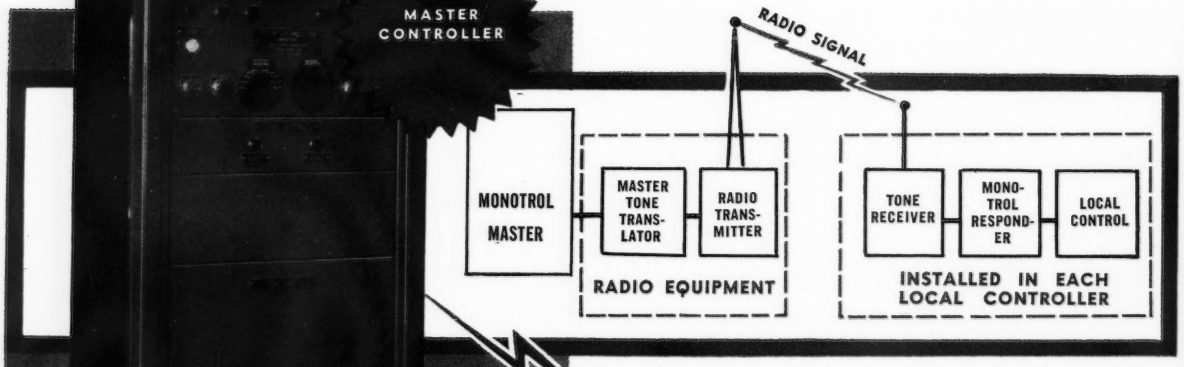

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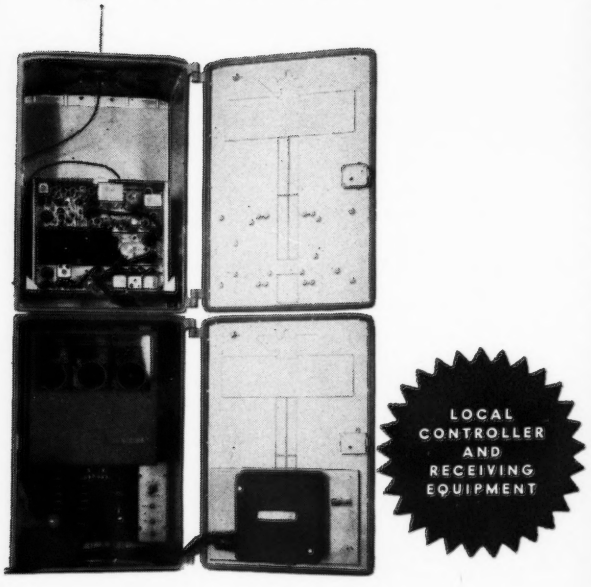

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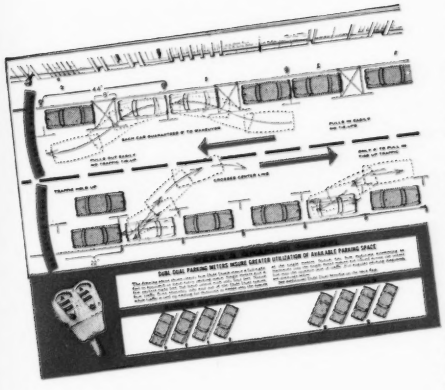

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Washington Chosen as Site of 1961 Annual Meeting of ITE

Washington, D.C., was chosen by the Board of Directors as the site of the 1961 Annual Meeting. In a close race with Philadelphia up to the last minute, the Nation's Capital won out on the basis of the facilities and attractions offered.

Previously announced have been the sites for the 1959 and 1960 meetings, with the meeting next year scheduled for the Commodore Hotel in New York City September 13-16.

The 1960 meeting is set for Chicago at the Edgewater Beach Hotel during the week of September 11.

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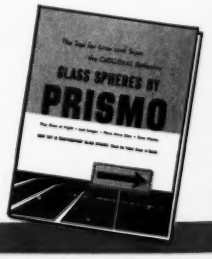

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